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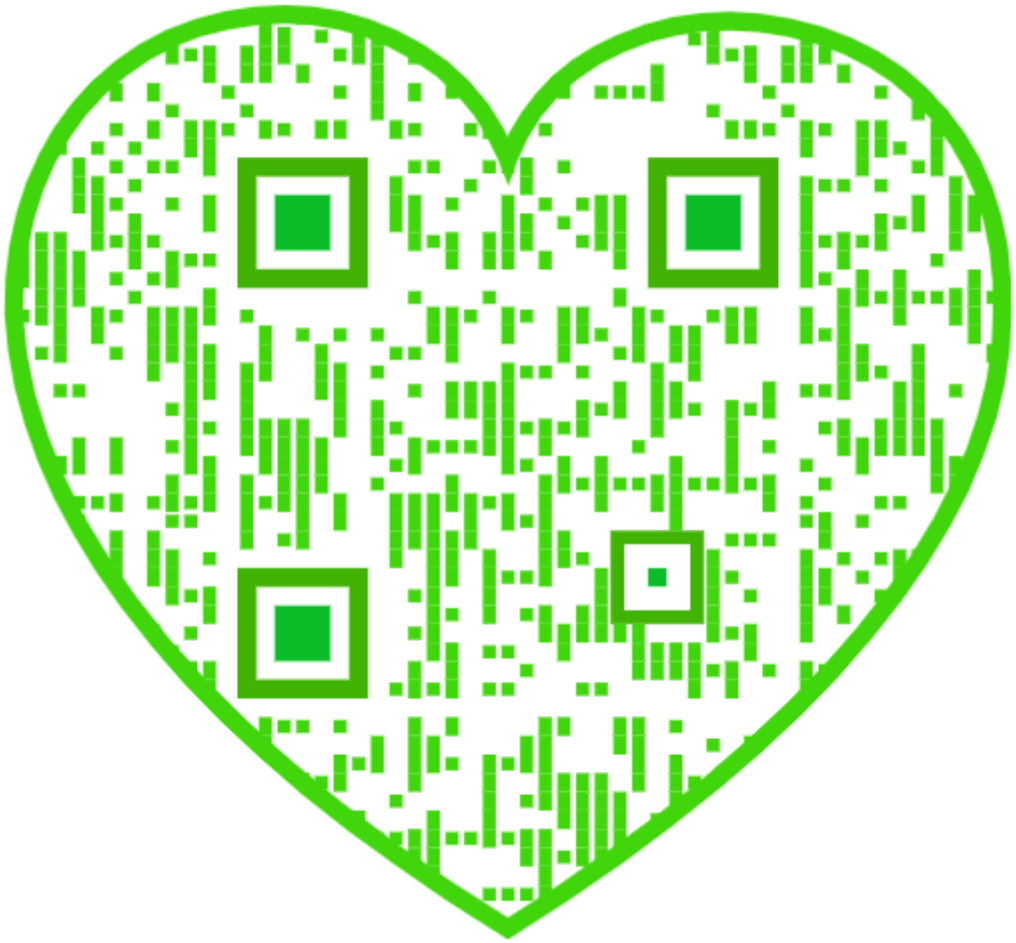
THE GARDEN PRIMER

GRACE TABOR
AND
GARDNER TEALL



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THE GARDEN PRIMER

There is not a corner on the face of the earth where with soil, sunshine, seed, sinew and sprinkling, one may not have some sort of a garden of growing things

THE GARDEN PRIMER

A PRACTICAL HANDBOOK ON THE ELEMENTS OF GARDENING FOR BEGINNERS

BY

GRACE TABOR

AND

GARDNER TEALL

NEW YORK

McBRIDE, WINSTON & CO.

1910

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TO

THE GARDEN'S APPRENTICES,

THAT THEY MAY SERVE JOYOUSLY AND WELL,

THE AUTHORS DEDICATE

THIS LITTLE BOOK

PREFACE

IT is the purpose of this little book to set forth in the most direct form, but without technicalities, the fundamental principles of amateur gardening in America. Unlike the greater number of the volumes one finds in garden literature it presupposes no knowledge of the subject, rather aiming to satisfy those who now for the first time wish to know how to make things grow, and are in need of a trustworthy guide to going about it. The tables included have been prepared with the greatest care, and the entire matter appearing herein should prove applicable to conditions throughout every state.

CONTENTS

CHAPTER		PAGE
I	INTRODUCTION	1
II	SORTS OF PLANTS	3
III	THE SOIL	7
IV	NOMENCLATURE	11
V	SEEDS AND SOWING	15
VI	SEEDLINGS AND TRANSPLANTING	21
VII	PLANTS AND CULTIVATION	25
VIII	FERTILIZING AND FERTILIZERS	29
IX	PRUNING	37
X	HOTBEDS AND COLDFRAMES	45
XI	GARDEN PESTS AND SPRAYING	53
XII	GARDEN TOOLS AND CULTIVATION	61
XIII	THE FLOWER GARDEN	63
XIV	FLOWER PLANTING TABLE	68
XV	THE VEGETABLE GARDEN	71
XVI	VEGETABLE PLANTING TABLE	74
XVII	THE GARDENER'S KALENDAR	79
XVIII	TABLE OF SPRAYING FOR GARDEN PESTS	112
XVIX	INDEX	115

LIST OF ILLUSTRATIONS

FACING PAGE

There is not a corner on the face of the earth where with soil, sunshine, seed, sinew and sprinkling, one may not have some sort of a garden of growing things. . . . . *Frontispiece*

The making of a garden opens to every man a vista of the delight of growing lovely things. 1

Flats should be filled with one part garden loam to one part leaf-mold 16

After sowing seeds in flats. 16

Watering the flats. 17

Firming the soil of flats 17

The workshop of a garden beginner. 20

Indoor sowing apparatus. 21

A flat of seedlings. 22

Growing salad seedlings in a flat. 22

Melon seedlings grown in a strawberry-box. 23

Melon seedlings five weeks after sowing. 23

Thinning out the plants from hotbeds and coldframes 28

A garden on a pile of rocks. 29

The rewards of careful cultivation. 32

Redeeming a neglected corner. 33

Seeded garden-beds. 36

Well-pruned trees. 37

FACING PAGE

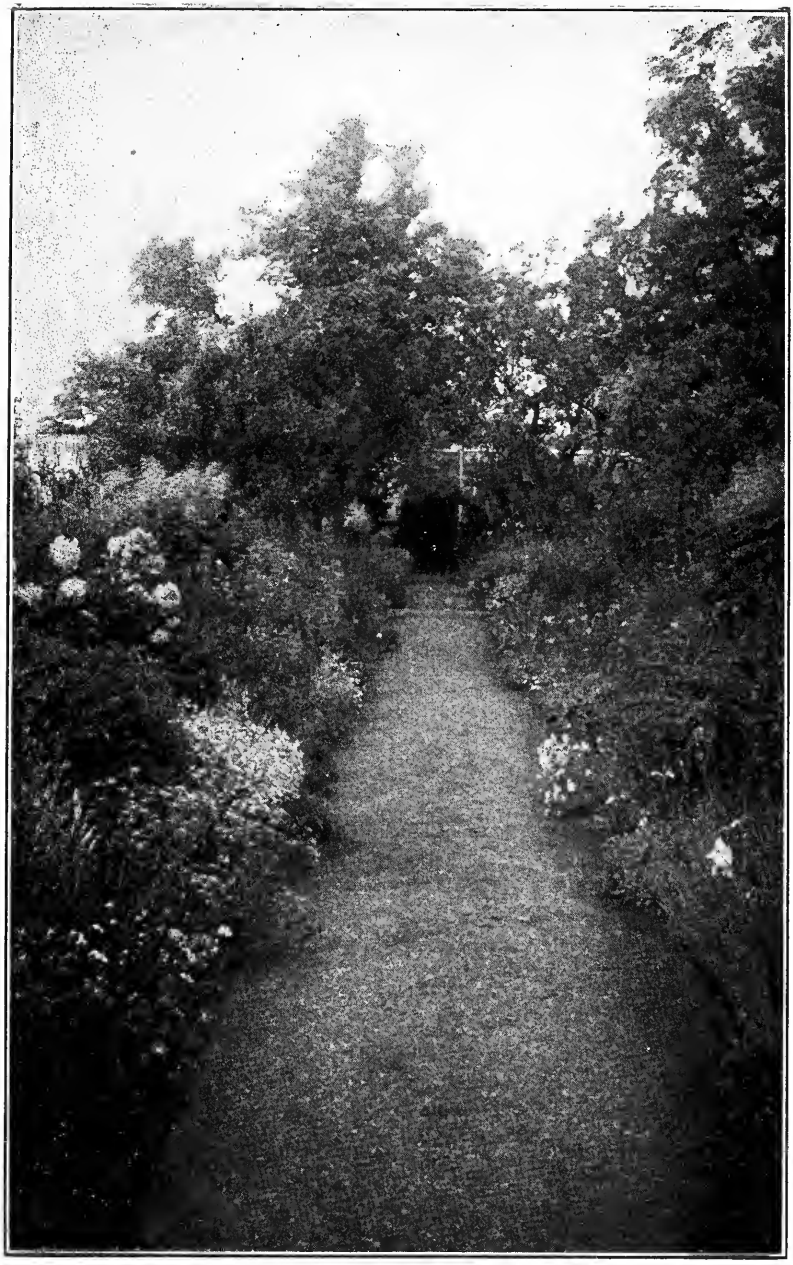
Manner of pruning shrub-branches..... 42
Pruned Geranium plant..... 43
Combination of good and bad pruning..... 44
The permanent hotbed..... 45
Hotbed soil..... 45
The garden beginner's work-bench..... 48
Marking off planting rows..... 49
Knapsack pump-sprayer..... 56
Spraying outfit..... 56
Hollyhocks..... 57
Barrel pump-sprayer..... 60
The gardener's friends..... 61
Making the back-yard attractive..... 64
A well-kept border of annuals..... 65
A neat vegetable garden..... 71
An old-fashioned garden..... 80
Beautifying the walls..... 81
Everyone may have such a garden as this..... 81

DRAWINGS

PAGE

Cross section of hotbed..... 46
Hotbed frame..... 47
Usual form of coldframe..... 50
Coldframe with double sash..... 51
Types of chewing insects..... 55
Types of sucking insects..... 55
Bucket hand-sprayer..... 57
Knapsack hand-sprayer..... 57

THE GARDEN PRIMER



The making of a garden opens to every man a vista of the delights of growing lovely living things, of watching them from the time of seeding until they unfold in marvelous maturity of flower and fruit

I

INTRODUCTORY

MAKING a garden is not the formidable thing it is often supposed to be, nor caring for it when once it is made half so arduous as many suppose it is. Faithfulness to it, from beginning to end, makes it a joy to everyone as well as a profit.

No matter how small a plot of earth is at one's command, whether it be four square feet or four acres, Mother Nature, aided by man's ingenuity, has growing things that will thrive in it. The thing to do is to find out which of the plants you like and need will grow in the space you have available for them, and then learn when to plant them and how to care for them and for the soil that is to nourish them when once they are planted, until the happy day when they will have reached their maturity, and you will have had the satisfaction of giving an assuring answer to the old-time question of "How does your garden grow?"

The first step towards garden-making should be with tapeline and a piece of paper. Measure up the space that is to be devoted to growing things and draw

a plan of it to scale on a sheet of heavy paper, locating thereon the position of the house, outbuildings, existing trees, shrubs, walks and all other features that must be taken into consideration in the planting scheme. Even if you are merely intending to have a border of flowers around the base of your house, sketch the outline of the building on paper as accurately to measure as possible; or, better still, hunt up the architect's working plan and trace its outline to scale. There is an excellent reason for this; growing things should always be considered in their connection with their environment, just as in their wild state they are considered as features of the landscape, against hillside, bordering ponds and rivers, fringing streams, carpeting meadows, and so on. So no matter how simple a plot you are planning to plant, a strip of shrubbery ten feet long by three broad may be all wrong if selected and planted without due regard for its place in the whole scheme of the premises. Likewise with a flower-bed (though we may concede to the necessities of the vegetable patch; only even there one has as good a chance to make the plants as attractive, in a measure, as in the Rose garden).

When you have planned your garden on paper and planting time approaches heed the warning not to rush into a seed-store, or a nurseryman's to buy a packet of every seed that has an attractive name, to take home and scatter about recklessly with over-enthusiastic faith that you have done all that is necessary to ensure a garden. Successful gardens are not made that way.

II

SORTS OF PLANTS

HARDY PERENNIALS are plants that withstand the winter in the ground and live for years, often indefinitely. They form increasingly large clumps which may be divided from time to time to make new plants, and these may be transplanted as desired, usually in the fall. Perennials may also be raised from seed planted in the spring or in late summer and will bloom the following season. Hardy Perennials include Trees, Shrubs and Herbs, and do not require a winter covering.

HARDY ANNUALS are plants that are sown from seed in the spring, last through several months of summer, and then die. The seeds may be sown in the open ground in April or in May, or under glass frames or in flat boxes indoors in late February or March.

HARDY BIENNIALS are sown one year, bloom the next year, and then die. These should have a light winter protection of straw, or leaves held down with brush. The seeds are sown the same as annuals.

HALF-HARDY PERENNIALS and half-hardy biennials are usually started under glass, but may be sown

in the open ground after May 15th. They require winter covering.

HALF-HARDY ANNUALS are to be treated in much the same way as tender annuals, requiring, as they do, the full time of a long summer in which to develop. They should not be sown out of doors until after June 1st.

TENDER PERENNIALS require still more care in starting them. Sow under glass and do not transplant to the open ground until after May 15th.

TENDER BIENNIALS may be treated as tender perennials.

TENDER ANNUALS are sown under glass in early spring and the seedlings protected from both excessive sun and cold. They are transplanted from flats to pots or boxes and finally set out after May 25th, by which time they are well grown.

SELF-SOWING plants are those which perpetuate themselves through the seed which they drop upon the ground around them. They cannot be depended on to come up in just the right place, but they may usually be transplanted. Poppies, however, are among those self-sowing plants which do not survive transplanting and therefore must be weeded out or allowed to remain where they spring up.

SHRUBS AND TREES are *woody stemmed* plants which differ very little, actually, from each other. Usually a shrub has many branches which start at the ground, while a tree has a single trunk. This is not uniformly true of either, however, and there is really

no arbitrary distinction; a small tree is called a tree-like shrub, while a shrub attaining to 30 feet in height is referred to under the same term. The line between the two cannot be sharply defined.

CLIMBERS are plants of *weak stems,* sometimes tall and sometimes low growing, which cannot lift themselves without the aid of some support. They may be in any one of the classes mentioned above and they may have woody or juicy stems. Those which twine around their support are, strictly speaking, *vines;* climbers raise themselves by means of trendrils, aerial rootlets or some special device provided for the purpose. Thus all vines are climbers, but all climbers are *not* vines. Nurserymen commonly mean tall growing plants when they use the term *climber;* lower growing kinds they define as *trailers.*

A difference of a single degree of latitude has a marked effect on many plants, though it is not distance north or south alone that tells. Some regions, for instance, from their topographical peculiarities, may be particularly adapted to the growth of certain things which ordinarily would not be hardy in that latitude; while possibly other localities further south are unfavorable by reason of their configuration to the cultivation of even lustier species. Altitude enters into the matter to a certain degree, likewise the texture of the soil, the proximity of large bodies of water and the direction of the prevailing winter winds.

The knowledge that all perennials are not as easily raised from seed as most annuals, and that the latter

produce an immediate effect instead of delaying a season, makes the latter more popular in one sense. No garden is complete without both, however, though the beginner will do well to undertake only a few of either and those of the simplest and easiest culture.

Of course it is apparent that under suitable climatic conditions the tenderest annual in the world might be perennial -that is, it might live indefinitely from year to year, from either root or self-sown seed; while it is equally apparent that the hardiest perennial of a North American garden would be only an annual if carried sufficiently far north from its native habitat.

Having thus briefly learned the sorts of plants and the character of their longevity, and having decided what you wish to plant and where to plant it, the next problem that confronts the garden beginner is the preparation of the soil of the beds that are to receive the plants. Therefore it is requisite that he should have some knowledge of the soil.

III

THE SOIL

ONE thing essential to a garden, and without which there can hardly be a garden, is proper soil. It is not necessary that the beginner should go into án exhaustive study of the subject, but a general acquaintance with the physical characteristics at least of the various kinds of soil, is imperative. Nothing can make up for a lack of understanding of this.

In the first place soil is classified in three ways: *first*, according to its origin, which means according to the rock from which it was derived—whether from limestone, sandstone, or from granitic formations, for example; *second*, according to its chemical properties—whether calcareous, alkaline and so on; *third*, according to its physical or mechanical properties—whether dry, moist, stony, gravelly, clayey, sandy or loamy.

But for the present we will overlook the first two classifications, giving attention to the third only, *i. e.* the mechanical or physical properties.

Soil is made up of particles of broken-down rock combined with decomposed organic (or living) matter. The size of these particles, their relation to each other,

the proportion between them and the air and water which they retain in the infinitesimal crevices separating them—these are the things which govern the physical characteristics and the soil texture; these, clearly understood, make it possible for anyone to follow a line of common-sense reasoning and arrive at the right thing to do to put any soil in the condition most favorable for supporting vegetation. For soil may be modified almost as one chooses, especially within the area one has at his disposal on the average home grounds.

DEEP SOIL means that having a depth of at least eight inches from the surface to the less productive sub-soil.

LIGHT SOIL is a term that has nothing to do with the actual weight, but means loose or sandy—open textured, the contrary to HEAVY SOIL.

LOAM is a soil in which the sand, silt and clay are properly balanced, making it mellow and friable. This is the ideal soil most generally favorable to plant life because, being a combination of sand and clay—of large and small soil particles—in about equal proportions, it retains moisture in sufficient quantity to supply plant food in solution, and at the same time it is properly aerated. Air is an important factor in soil and needed by the roots of plants quite as much as water.

The first thing toward actual garden making for the beginner to do, therefore, is to determine which side of the balance between sand and clay is over-

weighted in the soil with which he has to deal, and how much it is overweighted; there is a simple test which will show, approximately and near enough.

How To Test the Soil

Go out into the garden or onto the ground where the garden is to be, and turn up a spadeful of earth there three days after there has been a rainfall. Is it powdery and light? Then sand predominates—and when sand predominates organic matter is what is needed to bind the particles together. Is it sticky and like putty, retaining the imprint of your fingers? That means a lack of sand, with correspondingly too much clay; so it is sand or some loosening agent that is the thing required.

Ordinary manure is as good as anything you can get for supplying the needs of a too sandy soil, while deep plowing, which gives the water a chance to escape from clay, is often all that an ordinarily heavy soil that has lain unworked, requires to make it into a friable loam. If this does not lighten it enough, however, a dressing of lime should follow.

Begin your garden by doing this work with the soil. The weathering of it during a winter will help greatly, for the action of the frost and sun has a decided physical effect that should be taken advantage of whenever possible. With a spring beginning there is no time for these to do their portion of the work—but with a start made in the fall there are from six

to seven months ahead, during which the elements may have free rein. Turning up the ground in autumn is indeed sometimes recommended, even in old and established gardens, though this should not be done when the soil is wet.

With outdoors looked after, pay particular attention to all that the catalogues and garden literature have to say about soil. You know what they mean when they talk about sandy loam, or clay loam, or just plain loam, and you know which yours is. What have they to say about your particular kind? Never mind if they do not agree with each other or with what may be said herein; read them. You will find something to think about—you'll get ideas—and you will begin to appreciate how much there is of interest about this very common, ordinary dirt under our feet that we have always taken for granted. Our very lives depend upon it, literally. Isn't it worth studying a little bit?

IV

NOMENCLATURE

AT first, plant nomenclature, that is, the name classification of plants, may appear a staggering proposition,—but do not become discouraged with the names you feel you have to familiarize yourself with as you come to look over the seed catalogues and delve into garden literature. It is not half so bad as it really looks, nor as it sounds when one is beginning to pronounce the long and often unfamiliar plant names.

Indeed, your enjoyment of every growing thing will be very much keener if you make its acquaintance under its own true name instead of under some dubious nickname which may or may not fit. The true botanical name has been bestowed upon it for some definite reason by those who knew what they were about. It fits—and it means something. Learn it; pronounce it in sections, just the way it is spelled; nine times out of ten you will have it right—and the tenth is not going to matter at first.

Of course no one in his right mind will speak of familiar flowers under their Latin names in ordinary conversation. That is not why one is urged to learn

them; but there are very many things which we already know commonly under their true names. Why not know all of them? By doing so you will find yourself able to trace relationships among plants and plant families which you have never dreamed of.

There is, for example, the gigantic yet delicately lovely moonflower which blossoms only in the evening, the ever alluring morning-glory which opens with the sunrise, and the lacy foliaged cypress vine which bears its tiny, starry flowers all day, the same as other plants—all members of a family named Ipomoea, and all sharing a peculiar family idiosyncrasy in the shape of a toughened seed which must be soaked or filed before planting, in order to promote free germination. This is a very extensive family by the way, comprising something over three hundred members living in all parts of the world, each bearing a distinctly traceable resemblance to its kin.

Perhaps it will help you to understand the matter better if you compare the name of the plant with the name of a person, and fix in your mind the likeness between them. For instance, a certain individual is a Brown, let us say, a comparison to a certain plant being a *phlox*. That is the generic or family name. But which Brown is he? Why, John Brown, to be sure (or perhaps James Brown), that is the same as a Phlox being *phlox decussata* (or perhaps *phlox Drummondii*), only with the plants the names are reversed you see, as we find the Browns in the directory reading "Brown, John," but it means just the same as John

Brown. Now with the Phlox, *decussata* and likewise *Drummondii* are the species names, corresponding to the baptismal or christian name of a person. However, the identity is not yet sufficiently clear, as there may be several John Browns; which one are we talking about? John Brown the lawyer, perhaps, or maybe John Brown the doctor, and that is the same as *phlox decussata, independence,* or, again, *phlox Drummondii, stellata,* these third names indicating the variety and thus establishing beyond a doubt the particular Phlox we have in mind, just as John Brown the lawyer establishes the identity of the particular Brown we have in mind.

You will find family, species and variety all spelled with both capital and small initial letters. This is perfectly right though it may look queer. The rule is that capitals are only used when a proper name furnished the foundation for the plant name—*phlox Drummondii* for instance is a Phlox originated by a man named Drummond—while small letters are used at all other times. Unfortunately many are not as careful in this respect as they ought to be and mistakes are rather common.

There are, of course, many more divisions of plants than the three here given, but the others are of interest and importance to the botanist only. The practical gardener is not keen about marshalling great families into still greater classes, or clans and cohorts, and these again into some still larger group, with a more comprehensive title—and all things considered, it is probably

fortunate that this is so. One cannot but feel that the garden would suffer if it were otherwise, for the subject is absorbing, once it is undertaken—and proportionately exacting in the matter of time.

Common or popular names vary in different parts of the country so greatly that they are absolutely unreliable. Botanical names, on the contrary, are as fixed as the laws of the Medes and Persians, they come easy, once you get started, and you can order the thing you want from almost any dealer under the sun and be sure you are getting it right.

V

SEEDS AND SOWING

AS there can be no successful garden without proper knowledge of the soil, neither can there be a good garden without some knowledge of seeds. The gardener can never hope to know in a lifetime as much about these tiny mysteries as a little honest attention will teach him about dirt; still there is much to learn; much that may be learned and a little that must. Let us take this last—this necessity—first into consideration.

In planting seeds the inexperienced usually err on the side of thoroughness, burying them beneath a weight of earth that promptly smothers all their aspirations. There is a certain amount of energy stored in a seed—enough to reproduce the plant from which it came—but not enough to do more than this, to move many times its own weight of earth aside in order to do its work. Hopelessly they give up the ghost and go the way of all dead things, instead of the way of the living—and the gardener grumbles, when he has only himself to blame.

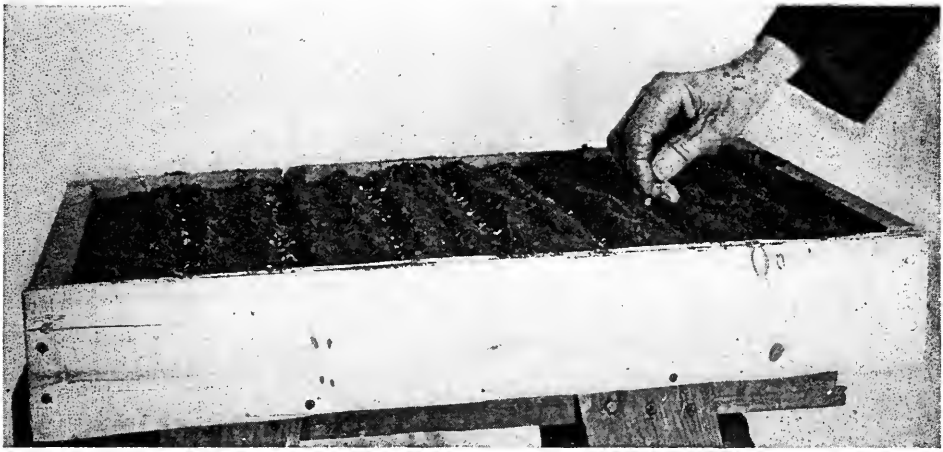
The earth-covering should never be deeper than five times, and usually not more than three times, a seed's greatest diameter, when planting out of doors.

In frames or flats (shallow boxes) indoors a covering equal to the seed's own diameter is sufficient, because in the latter situations the moisture and temperature can be artificially regulated. The greater depth out of doors is simply to insure against drying out and chilling the seeds where there is no means of governing these factors.

Whether you are going to plant indoors or out, water the soil where the seeds are to go thoroughly the day before putting them in. This will bring it to just the right degree of mellowness at the time of sowing.

Seeds go into the ground in drills (as do Sweet Peas), in hills (as do Melons), singly—that is in continuous rows or in clusters, one at a time—or scattered like grass (as do Poppies and Petunias), according to the plant which they will produce. The packet in which each variety comes has printed upon it the method to be followed with the seed enclosed; so that part of it is easy, as these directions are usually reliable—always so with first-class seedsmen.

If you have seeds to sow in drills, lay a board down upon the proposed bed or wherever the seeds are to go, for a "ruler," draw a line along its edge with a pointed stake for a "pencil," dragging it deep into the soil or lightly along its surface according to the depth of drill the diameter of the seed demands; scatter the seeds into this little trough and brush the earth that was pushed



Flats should be filled with one part garden loam to one part leaf-mold, and enough sand added so that the mixture will crumble apart after being squeezed in the hand

After sowing the seed either in rows or broadcast, sift over them enough fine soil to cover them to a depth of two or three times their diameter

In watering the flats cover the soil with burlap to prevent washing out the seeds

After sifting the soil covering over the seeds press the whole area firmly with a flat board. A shingle will do, but you can easily make a firming board like this

out of it, back over them. Then pat it lightly down with a float—a "flatiron" contrivance of wood, 6 x 9 inches or thereabouts and an inch or two thick, with a small piece nailed upon its upper side for a handle. It can be made of any old pieces of wood that happen to be available.

Seeds sown singly in rows should have the same long drills marked for them, the seeds themselves being dropped in at regular intervals instead of continuously. Hills are just shallow, saucer-shaped depressions into which the requisite number of seeds are dropped, separated so that they will not touch each other. The earth is drawn over them and as the seedlings shoot up, gaining in height, more earth is drawn up from the sides until the hill is formed which supports the little plants and deepens their roots.

Scattered or broadcast sowing is like the sifting of pepper from a shaker, and the earth over the seeds is sifted on in the same light fashion if any at all is used to cover them. Usually seeds that are scattered are simply firmed into the ground by pressing with the float, the idea being always to bring the grains of soil close against the seed on every side, keeping it evenly moist by capillary action and allowing no irregular spaces for air to intervene and shut off this moisture. Air is essential, to be sure, but not an excess of it on one side and none on the other.

The beginner is apt, however, to give an excess of water rather than of air. Many a garden has been drowned under a simple faith that it is being thor-

oughly watered. The amount of water a garden requires is just enough to maintain the soil at a condition of slowly crumbling apart in the hand after being squeezed—and this proportion should be *constantly* maintained. Too dry a soil or a soil that is too wet even, is not so bad as the alternations between the two extremes which careless gardening permits.

Seeds vary greatly in the time required for germination. Some sprout as soon as the earth closes around them, seemingly, while others lie dormant for so long that the novice at last gives up hope, growing so thoroughly resigned to his disappointment that he forgets them completely, when lo! Up comes the living green one day, quite a year perhaps, from the planting time.

But happily such procrastination is found only among the slow growing plants, with which the beginner is seldom tempted to experiment—the perennials which furnish our trees and shrubs and hardiest vegetation generally. Flowers and vegetables ordinarily spring quickly into activity, in a very satisfactory and obliging manner, rewarding the beginner's labors usually within a fortnight—sometimes much sooner.

So much for the practical details of seed handling; and now for one or two things about seeds themselves that ought to be understood—and that are interesting to know.

A seed is the case in which, carefully folded and ingeniously packed away, lies an embryonic plant, with the food necessary to sustain it for a certain period of its life above ground. In some seeds this plant is

developed enough for microscopic dissection to reveal it plainly, in others it is very rudimentary.

Usually it has two plump divisions called cotyledons—four syllables *cot-y-le-dons,* with the accent on the first; there are, however, plants which have more or only one, but they will come later—and these, if they push their way up through the earth—some do not—spread apart and look to us like leaves. Consequently we usually speak of them as the first or seed leaves, although they aren't leaves at all. It is between them and protected by them that the actual growing point of the plant waits,—the plumule or true leaf-bud whence the real plant is to arise, with the plant's true leaves.

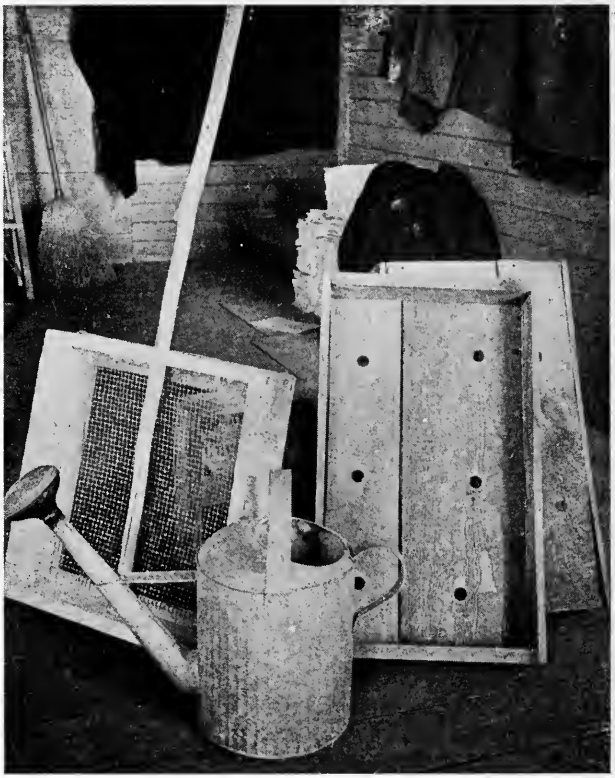
The cotyledons are only caretakers—the nursemaids of the baby plant itself—which feed and guard it until it has grown big enough to draw its own sustenance, through its true leaves and the little roots that have been keeping pace underground with the leaves' growth, from the elements about. Until a true leaf is formed, every plant lives on the food stored away with it in the seed, no matter how miscroscopic that seed may be.

Not until the true leaves have developed, generally speaking, are seedlings strong enough to bear handling and transplanting. Some of your seed packets will tell you to transplant when the third leaf appears, or to thin out when the true leaves appear, which means of course the third leaf after the cotyledons in the first instance, the first pair of leaves in the second—for sometimes the true leaves appear in pairs, opposite on their stalk,

while others come out singly, one on one side, the next on the other. Always follow such directions carefully and do not anticipate nor wait beyond the stipulated time.

Once you have watched a seedling—any seedling—through its rudimentary growth from funny, round or oval, sturdy little cotyledons to two or three true leaves and noted the marked difference in the appearance of the latter from the former, you will wonder why you never noticed it before—if you have not. Seed germination is one of the most interesting things in this very interesting world, though it is common—almost as common as the dirt.

Here is the workshop of a garden beginner
who has learned that everything in
the place for it saves time and
and makes gardening half
as easy again



Here we see Flats, Soil-sifter, and Watering-can all ready for the garden beginner who would experiment with raising plants indoors to set out later

VI

SEEDLINGS AND TRANSPLANTING

SEEDLINGS are little plants just from the seed raised indoors or out, wherever convenient. Their removal to better places—the process of transplanting—is a part of gardening extremely important for the garden beginner to understand, inasmuch as he may often make almost his entire garden this way, on the first season, buying seedlings from a florist if he has been late in making a start with garden operations.

The soil into which seedlings are to be moved from their seed bed should be in about the same condition, as regards moisture, as the soil in which seeds are sown—that is, as moist as a previous day's watering will make it. And the soil from which they are taken will, of course, be about the same, and will yield their roots readily, without tearing.

At this stage of operations comes in the *dibble*—a most useful affair which, thrust an inch or so into the earth half an inch from the seedling, is twisted and worked and tilted this way and that gently until the soil is loosened enough to let the little plant be picked lightly from it. For very tiny plantlets a toothpick

makes as good a dibble as may be had, but there are occasions when a section of broom handle, sharpened like a long pointed pencil, is not a bit too big. A little practice with the tool will quickly teach you the size appropriate for any particular plant.

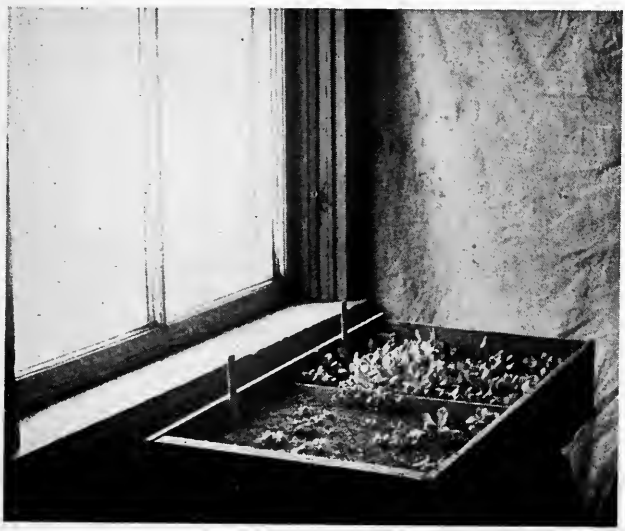
Lift the seedling by taking one of its leaves carefully between the soft ball of the thumb and index finger—you will be surprised at the ease with which you will handle mere atoms of plants this way—not touching the body of the plant at all, nor allowing its roots to come in contact with anything.

Thrust the dibble into the earth at the spot the plant is to occupy, making a hole as deep or a little deeper than its longest root; lower the seedling into this hole until it is as deep as it originally grew, then thrust the dibble down once more, half an inch from it this time, and by tilting the handle over towards it gently press earth against and around its roots. If the hole seems insufficiently filled after this, leaving the plant unsteady and loosely set, thrust the dibble down at another spot or lay its point flat onto the soil,—alongside the plant's stem and press down until the earth falls into place, filling the hole completely. Do not pack the dirt, but make it firm.

Water moderately after the work is finished, unless the sun shines on the plants; this will help to carry the earth close around the roots, settling it and pressing out the air pockets.

With seedlings always be particular about obtaining them in a fresh condition from your florist if you have

A Flat of Seedlings ready to be pricked off and transplanted



Growing Salad Seedlings in a Flat placed by the window to receive the sunlight

Melon seedlings that have been started indoors in a strawberry box

Five weeks after seeding these melon plants are ready for setting out

not yourself grown them from seed. It is not wise to set out sun-wearied plantlets that have been taken up from their beds and allowed to stand for hours without proper care and protection. Seedlings once removed are tender things until they find themselves at home in their new environment, and make a fresh start by taking hold upon the soil that has adopted them.

Short and stocky plants transplant always with better results than those of tall, thin and "spindling" growth, and this sturdiness should always be the guide in making a selection from commercial stock. Where seedlings are being raised by the beginner, let him bear in mind that a plant which is frequently transplanted endures the operation with much more grace than one which is left long in one place. Frequent transplanting tends to the development of a more compact root system which will be made up of many fine and hair-like short feeding roots instead of the long, tenacious growth which the undisturbed plant is able to put forth —and naturally the former are less liable to injury and breakage when lifted than the latter.

There are probably no plants which cannot be transplanted by a skilled operator, but there are many which certainly will not tolerate the treatment of any but an expert—and some that even the expert shrinks from handling. Usually these are species or varieties which send straight down, deep into the earth, a long, trunk-like root which is called a tap-root. This simply will not yield to removal without breakage.

Whenever the instructions on a seed packet direct that the seed be sown where it is wanted in the garden, and say nothing about transplanting, it is very likely that the plant is one of those which puts forth such a root—and the direction should be literally followed, else there will be failure.

Good-sized, growing plants with a mass of roots large enough to need some earth removed to make room to set them, may be firmed into place by filling with water, gently poured, a depression left around their crown. After this has settled, the rest of the earth is thrown into place—and thus the whole operation is accomplished with comparatively no violence or shock to even the tenderest rootlets.

VII

PLANTS AND CULTIVATION

WHEN plants have reached maturity or approach it; whether flower, fruit or vegetable, watch them closely and do not withdraw constant care from them. Volumes written about them could not cover, comprehensively, all their little queernesses and strange freaks. Each one seems almost a problem by itself, sprung up from the ground to show some new phase of Mother Nature's ingenuity, and each gardener must learn by his own experience how to meet the particular emergencies arising from the combination of soil, weather and plant with which he has to deal.

But while maturing plants differ in their requirements greatly and each must be studied by itself, there is one thing that is appreciated by all alike, and that is tillage. The man with the hoe, *and* the rake, *and* the cultivator, is the being they hail as friend, be sure of that. Indeed this stirring of the soil is so great a benefit that one of the most ancient garden maxims says "tillage is manure."

It is not alone to keep the weeds down, however, that this stirring of the surface must be kept up, surprising as it may seem and contrary to popular

notions. Incidentally it does prevent them from gaining a foothold of course, but its great merit lies in its action on the soil itself.

Moisture is carried through soil by capillary attraction. When rain or dew falls on the ground it penetrates to plant roots by means of this action, going down and down until it is equalized in the soil or finds a way through into still deeper fissures and drains out into rivers or sp ings.

With the coming of fair weather after a rain, however, this downward action is immediately reversed on the surface, where the water particles first yield themselves to the air and heat of the sun and pass from the ground completely. Gradually the pull upward of this same capillary force draws the fluid from deeper down until all that the thirsty earth has absorbed is relentlessly taken from it and scattered in the air again as vapor.

But tillage is the interrupter of this robbery of the sun. It interposes a little, thin blanket of soil particles which are too widely separated from each other for capillary pull to be efficacious, and the soil beneath it is thus enabled to retain the precious drops for a much longer period, even in decided drought.

Then, too, this finely pulverized, blanketing soil absorbs moisture more readily than a hard-baked, unstirred surface, and even the light precipitation of dew, night after night, is greedily drunk by it.

So the importance of tilling rests not in its merit as a weed eradicator, you see. But happily it does

eradicate them thoroughly—for weeds are gluttons and by virtue of this spirit in them are able to take the best of everything from a piece of ground, starving out its rightful tenants.

Go over a garden—or a bed, or whatever you are tending—at least twice a week with this gentle surface "scratching." That is all that it need amount to, really; the stirring need not be deep—an inch of loose soil is enough—but it must be frequent, and only heavy rain should be allowed to interfere with the semi-weekly repetition of it.

For small surfaces one of the small hand weeders is excellent. For larger spaces a hand cultivator, made purposely for tilling and used like a hoe, is better. There is, too, a wheel-hoe, which is excellent in garden rows, though it is not adapted to every sort of location as the hand cultivator is.

Deeper stirring of the ground has more marked physical effects on the soil, hastening chemical activities and making the stores of plant food available. Very often soil contains all the elements necessary to support plant life richly, but not in such form that the plants can consume them. Therefore they go hungry in the midst of plenty, even as a man might in the midst of quantities of those elements which science has found out compose man—if they were not present in forms available to his teeth, appetite and digestive apparatus.

Remember always, however, that deep tillage is not a conserver of moisture. On the contrary it lightens

stiff and heavy soils by draining them. Thus they become "deeper," warmer, finer and consequently more easily penetrated by the tiny hairlike rootlets that are the actual feeders.

Plants growing as specimens—that is shrubs or flowers set by themselves and not in a bed or border—need this same treatment and respond to it with gratitude almost as marked as the humbler garden stuff shows. Even trees appreciate the loosening of the earth around their trunks. Indoor pot plants, too, should be included. In fact one should cultivate the habit of disturbing the surface soil around practically everything that grows, for tillage is a requisite first, last, and all the time, to which everything else is secondary.

By the time April comes around the plants in your hotbeds and coldframes will need thinning out, so strong seedlings will be ready for May transplanting

Even a pile of rocks in a back yard can be made into a lovely Rock Garden, and such a garden has inspired many a beginner to further experiments

VIII

FERTILIZING AND FERTILIZERS

IT is astonishing that such a measure of good luck attends the guesses which most of us make at supplying the needs of the soil—or to be more exact, the needs of the plants which grow in the soil—because very few really know anything about it. But of course the makers of commercial fertilizers have helped us greatly, and there are many, scientifically compounded and of real value, upon the market, every pound accompanied with directions for its application to the soil. What these compounds do, however, and why they do it, and why it needs doing, are details of the matter that even very advanced gardeners do not trouble to concern themselves with—at least not often. The general idea is to make the soil "rich," and if one thing doesn't produce a crop luxuriant enough to indicate that this has been accomplished, something else is tried—something that is hit upon somehow, somewhere, that somebody says is good because it has benefited some other garden.

Of course everybody knows that the growth of a plant requires food just as much as the growth of a chi d or a bird or anything else in creation requires food.

But the ideas about this food are very vague; "what plants eat" is an untold tale, mysterious, almost chimerical to the practical mind accustomed to seeing before believing. Let us see if we can't straighten this out a little and come to a real comprehension of plant feeding; then fertilizers will not seem so deadly dull and uninteresting,—and incomprehensible.

The food of plants consists of thirteen "chemical elements." Nine of these are taken by the plant directly from the soil—these are the pure mineral plant foods—three are taken from water and from air, and the thirteenth and last is taken principally from decaying organic matter in the soil.

In order to understand this quite clearly let us stop just here long enough to take a look at the chemical classification of the soil, spoken of in a previous chapter. Soil is made up of mineral matter and organic matter—two forms that are of course, widely different—and to get at this composition of it in the simplest way possible we will follow the suggestion of one of the Department of Agriculture experts and magnify a cubic inch of soil, in the imagination, to a cubic mile—and then look it over. It becomes very vivid, and the processes going on in it are plainly revealed, under such examination.

It will look like a mass of rocks and stones varying from the size of a pea to boulders several feet in diameter. These are the mineral particles—in common parlance the "dirt"—which predominate and form the foundation of all soil. Among these rocks and stones,

in many of their large and small interstices, will be decaying pieces of plant roots and stems and other organic matter which appear very much like logs and pieces of logs rotting among masses of rock and gravel. All of this organic substance will be dripping with water like a soaked sponge while all the stones and rocks have a layer of water over their surfaces. And finally, in all the spaces where there is nothing else, there is air—indeed nearly half the volume of the whole cubic mile is air.

A plant root coming down into this magnified cubic inch of soil would be of course an enormous thing, pushing its way among the rocks and stones and decaying matter with a great, tireless, steady, resistless, pressure that would move the biggest of them. Near the tip of this ever extending and down-reaching growth, small hollow tubes—root hairs—would be seen reaching out and feeling this way and that, sucking the water from the surfaces of the rocks and from the dripping, spongy masses among them by drawing it through their thin and delicate walls.

In this water is the mineral food, dissolved off in the minutest particles from the "rocks"—and it is somewhat staggering to note, by the way, that in order to produce one pound of growth in dry matter—that is in branch and leaf, flower and fruit—*from* 300 *to* 800 *pounds of water* must be taken in by a plant's roots, drawn up through its stalks and branches, and discharged or "transpired" by its leaves. Think of the stupendous work being carried on by all the silent green

things that we give scarce a thought to in the long, drowsy summer days!

All fertilizers present, in different forms, three essentials—phosphoric acid, potash and nitrogen. The latter is the last of those thirteen chemical elements mentioned which feed vegetation—the one which comes principally from decaying organic matter in the soil—and in some respects it is the most important of all. Unfortunately it is the one most easily lost, nitrates being very soluble, through washing out, or exhausted in other ways; therefore it is the one which should be applied only in sufficient quantity for the immediate use of the plants to be grown, and just at the proper time for their needs. It is usually well to wait until they are above the ground.

Surplus phosphoric acid and potash, on the contrary, will usually remain in the soil until succeeding crops use them up, so it does not matter so much if these are applied in excess. They are not wasted.

What is known as a complete fertilizer is a combination of these three in the proportion generally of 1 part nitrogen, 2 parts phosphoric acid and $2\frac{1}{2}$ to 3 parts potash. Such a fertilizer will meet all requirements of the average garden, especially if the soil is treated with lime first. Lime is not a fertilizer in the strictest sense, but it sweetens the soil as well as helps to bring about physical and other changes that make plant food available.

The sources of each of these three fertilizer ingredients are important to know and remember, for even

With careful cultivation such current-laden bushes as these will reward the garden beginner for all his trouble and pains

A heretofore neglected corner of the yard has been spaded up, bedded, fertilized and planted, and the season will bring rich reward for the garden beginner who has taken the trouble to do it

though a complete commercial product that just suits one's garden is found, it is well to have an intelligent understanding of its composition. Many times the application of one of the three is all that is needed and where this is the case it is much better to use only the one—for gorging the soil is as bad as starving it.

Nitrogen is supplied by nitrate of soda, sulphate of ammonia, cotton seed meal, high grade dried blood, green manuring—that is a leguminous crop such as cow peas, clover of all kinds, soy beans and others, grown and plowed under—and by stable manure. No fertilizer is better than the latter if properly handled and all fertilizers should be supplemented by it for the humus that it carries into the soil.

Potash is furnished by muriate and sulphate of potash—the latter is preferable as it can be used on all plants while the former cannot—by a crude German product called kainite, and by unleached wood ashes. The latter of course yield it in a much less degree for a given bulk but they are invaluable as a fertilizer.

Phosphoric acid comes in "floats"—that is in South Carolina rock from the phosphatic beds of that state—in what are known as superphosphates, and in the various kinds of plain bone meal and bone ash or ground bone "flours" that are on the market.

The work of these three elements is divided of course, but generally speaking nitrogen promotes luxuriant growth of leaf and branch, hence is the greatest stimulant to vegetables, especially those of which we eat the tops or leafy portions; potash builds up and

strengthens wood and fruit, while phosphoric acid seems to be the especial food which flowering plants, whether shrubby or herbaceous, most appreciate.

Learn to watch your garden and find out from the plants and the way they grow just what it is that they need. Do not for instance give nitrogen when top growth is rank and luxuriant, but fruit of poor quality and not abundant, for such a condition probably means that trees are starving for potash. Of course all the elements should be present in order to get the best results—but frequently it is necessary to supply only one in order to make the proportions right, as already suggested. The trick is to find out which one.

It is largely a matter of common sense, once you know what is what—and without knowing this no amount of directions will be any real help. It is necessary to realize what is going on down in the ground where the roots are doing their work—how they are gathering up one substance and another in the tiniest and most minute particles—in order to realize that a very little too much of one thing or a very little deficiency of the other will actually work ill to a plant—or well.

Finally, there is one other thing about the soil that should here be mentioned, partly for the reason that it is so generally overlooked in all that is said or written about soil, good or bad, and partly because it is interesting. It is a phase of soil fertility that does not enter perhaps into the beginner's gardening, but who can tell what moment the beginner, inspired by success and

other things, is going to branch out and become a real scientific agriculturist who wants to know everything? And then besides, who can know too much, even though he is but a beginner?

It is only recently comparatively, that investigators have been led to believe that plants give off certain organic substances during the processes of growth which, accumulating in the soil, are harmful to the successive growth of plants of the same kind. This may be the reason, or one of the reasons, why the benefits of crop rotation are so marked: the soil is freed from the toxic matter emanating from one species in the three or four years during which other crops are grown upon it. Sometimes—not often to be sure, but sometimes—poor and sterile soil may be poor and sterile because thus poisoned.

But that is a big subject and such a condition will hardly occur in even a very advanced beginner's garden. So one need not to go into the matter at first. However, remember it if later experience ever brings you the baffling problem of a soil that consistently and obstinately produces only failure under every kind of manipulation. There are such—soils that *will not* yield nourishment enough to sustain plant life—but happily they are being studied and experimented on until the reasons for their sulkiness stand small chance of remaining secret much longer. And every State Agricultural Experiment Station is ready to give anyone who may ask all the information which they have acquired on the subject—or to go farther

and take up the individual problem by making an analysis of a soil specimen submitted to them, and to advise according to that analysis.

It is decidedly the part of wisdom to apply for this expert advice when an unusual condition exists; and such application is not only encouraged but it is urged by the Department, for of course each new problem means further opportunity for research and therefore a greater possibility of important discovery.

It is a satisfaction to lay out seeded beds against the time when they grow into the full maturity of fair flowers and fat vegetables

Well pruned trees enhance the beauty of any lawn, and add greatly to the attractiveness of the home grounds. Every garden beginner should bear this in mind, and also that pruning in time saves nine trees out of ten from early decay

IX

PRUNING

NOWHERE is the struggle for existence keener and fiercer than in the vegetable kingdom. Thousands of seedlings sprout for every one that reaches maturity, and everywhere along the way, from root to branch and fruit, there is the same lavish extravagance in Nature.

This is the chief reason for Pruning, broadly speaking; the principle of it is always to relieve the plant by reducing this struggle. For, of course, when its efforts are constantly strained to the utmost in just keeping alive, it cannot produce flowers or fruit in abundance nor of very high quality. And similarly when there are too many branches, none can be as strong and leafy as they should, for all are insufficiently nourished.

The process of pruning is an operation which has three objects in view, viz:

1. *Pruning proper*, that is removing parts of the plant for the purpose of producing better growth in the remaining parts.

2. *Training*, or arranging the branches of a plant to conform to certain directions of growth,

attended nearly always with pruning proper or trimming.

3. *Trimming*, pruning the branches of a plant for the purpose of ultimately bringing the plant to a preconceived shape, or artificial form.

Thus the branches of a lanky plant may be (1) *pruned* to give it better growth, (2) *trained* to make them spread in the desired direction, and, later, (3) *trimmed* to make them conform to the shape it is desired that the plant should assume, or retain.

Plants, unlike animals, do not suffer from the shock of amputation, for pruning is just that,—a sort of plant-surgery as it were,—*when it is properly done.* Indeed, properly done, it is an operation which greatly promotes the vigor of the plant subjected to it. And a little pruning every year is like the stitch in time, for the destruction of an ambitious shoot as soon as it starts is far easier on the tree and the gardener, too, than the laborious task of sawing through a good-sized limb after it has had time to mature.

In the first place there are two things about *form* to remember in pruning;—one, applying to trees especially, is that leading branches must never be allowed to spring from the same point on the trunk—or from *opposite* the same point is perhaps clearer—while the other, applicable to every sort of plant, is that, generally speaking, the outer shoots or branches should be left and the inner ones cut away.

In the first instance the tree is weakened structurally and will split more readily under stress of wind or ice—

or fruit—when its branches diverge at just the same level, forming a sharp crotch or Y; in the second, a plant becomes choked and top heavy if inner growth is constantly encouraged and the branches rub and interfere, injuring each other.

And then there is a very important thing that does not concern form at all, but does concern flowers—consequently fruit—vitally, and, therefore, must be always remembered and considered when there is any clipping to be done. This is the fact that every tree or shrub or vine has its own little personal peculiarity about flowers and the manner of producing them—and produces them usually *only* on wood of a certain age—sometimes one year, sometimes two, and sometimes even more. So it is always necessary to know the peculiarity of any plant in question in this respect before venturing to lop off a branch, else an entire season's product may be literally nipped in the bud.

Of fruit trees the apple and pear bear on "spurs" of old wood that may be anywhere along the branches—but peaches are always borne on wood of the previous season's growth. Trimming off the annual shoots will therefore sacrifice the fruit of the latter but not of the former; while "heading in"—that is, removing the ends of the branches with their growing terminal buds—being a process that encourages the growth of lateral buds that are waiting for just this to happen, into shoots or young branches, of course increases the amount of new, therefore of fruit producing, wood.

Of flowering shrubs the hydrangea and the lilac afford much the same contrast as the apple and peach among fruit trees. Hydrangeas bloom on wood of the season's growth, lilacs on wood of the previous season. The former may be pruned very early in the spring therefore without danger of destroying the blossoms, but the latter should be gone over with the knife only immediately after flowering. This gives them the chance to grow branches for the next season and to stow them with flower buds before frost interferes.

It is, of course, hardly possible in this limited space to name a very complete list of trees and shrubs, with their peculiarities in regard to bloom, but some of the most commonly planted are included below.

TREE FRUITS

Apple. Fruit borne on old spurs—prune in spring, or after the fruit is gathered.

Pear. Fruit borne on old spurs—prune sparingly in spring, or after the fruit is gathered.

Plum. Fruit mostly on spurs, but in some varieties on both spurs and annual growth—prune in spring.

Cherry. Similar to plum—prune in spring or after harvest.

Peach—Fruit borne near base of previous year's shoots—prune after harvest.

SMALL FRUITS

Blackberry. Fruit borne on canes of previous season's growth—cut old canes out after fruiting, cut young canes back as soon as two feet high—cut laterals on these sparingly at tip in spring, or not at all.

Raspberry. Same as blackberry; spring pruning is only to thin the fruit; all cutting back should be done the previous season.

Currant. Fruit borne on both old and young wood—the best on base of 1 year shoots springing from 1 year spurs; have no wood over three years old.

Grapes. Borne on wood of present season *which rises from wood of previous season;* fall or winter pruning is best.

FLOWERING SHRUBS

Roses. Flowers borne on new wood—prune out old wood and weak shoots after flowering—or cut back before life shows in spring from $\frac{1}{2}$ to $\frac{4}{5}$ of bush.

Forsythia. Flowers borne on old wood—prune immediately after flowering.

Hibiscus. On the season's shoots—prune fall or early spring.

Honeysuckle. See Lonicera.

Hydrangea. Borne on the season's shoots—prune fall or early spring.

Lilac. See Syringa.

Lonicera. Usually on season's shoots—safest to prune immediately after flowering however, as some varieties bloom very early.

Philadelphus. (Commonly called Syringa.) Borne on old wood—prune immediately after flowering.

Spiræa. (Shrubby varieties.) On old wood—prune sparingly after flowering.

Syringa. On last year's wood—prune immediately after flowering.

Viburnum. On old wood—prune after flowering.

Weigela. On old wood—prune after flowering.

Clematis. On season's shoots—cut down in winter or early spring.

Evergreen hedges. Prune in June, trimming just enough to keep the chosen form.

The final word in pruning however must always be "restraint." Dead and weak wood should be cut from shrubs, superfluous branches which crowd a tree should be taken away—but only a little should ever need doing at one time or season. And only a little will need to be done at one time, if that little is attended to as each year brings it. Great branches of trees cannot be removed with impunity. Pruning should be practiced annually, from the period of young growth; the resulting wounds will then be small, and knot holes will not open themselves to the ravages of fungous plant diseases and of decay.

As to the manner and fashion of severing a branch or a shoot there is not a great deal to say. Not but that many wrong ways are in evidence—but the right way is simply explained. Large limbs should always be cut *as close to the main trunk from which they spring* as it is possible to lay a saw—and the cut should always be *parallel* with the main trunk and *not at right angles* to the branch taken away. *No way but this is right, no matter who practices it.* In the case of very large and heavy limbs—which ought never to be cut down unless there is a reason absolutely imperative—it is

This illustrates the manner of pruning the branches of shrubs (Privet in this instance), to induce bushy growth. By such pruning three branches will result where but one grew before

This illustration shows a Geranium plant that has been pruned. The cuttings—"slips"—have been started in other pots for new plants

best to remove the limb with two preliminary cuts, trimming the stub down to the proper level of the trunk afterwards. This prevents any splitting down of the limb as it gives way and makes a much neater and better job.

The first of these two cuts should be made from the *under* side of the limb up, about five or six inches from its rise on the trunk; this should extend more than half way through the limb. Then half an inch nearer the tree trunk make the second cut, from the *upper* side of the limb down; and the branch will fall to the ground without splintering or tearing the bark in the least. Then lay the saw flat against the main trunk and take off the stub. This levels the surface and prepares for the healing process which Nature will immediately take up.

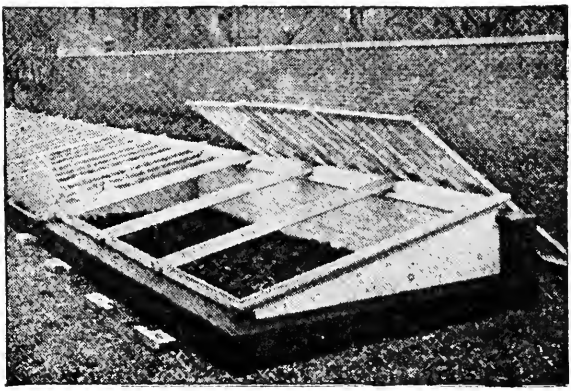
Shoots and small branches should always be severed just above a bud, as near to it as possible yet far enough away to avoid injuring it. And in plants on which the buds alternate, an outward setting bud should be the one left at the top of a pruned branch; in this way an outward growing branch will be assured—and that is the thing to be aimed at.

All plant growth is carried on by the *terminal buds*—the buds at the end of the branches and twigs. Back of these and ranged on either side of the stem or branch, usually at regular intervals, are what are called the *lateral buds*. From these, new branches spring—but only from comparatively few of them. Thus there are always a lot of seemingly useless buds ranked along every main stem.

But far from being useless these are Nature's wonderful reserve, held back for weeks or months or maybe years as the case may be, yet always in readiness to spring to the rescue when the plant's normal leaf surface is taken away. For leaf surface cannot be reduced—the proportion between it and root surface must be maintained. With wonderful intelligence and patience they wait, therefore—these reserve buds—until injury comes to the terminal bud. Then they fairly leap into activity in their haste to supply the loss.

It must always be remembered, therefore, that pruning at branch ends stimulates excessive growth of shoots up to a certain point—beyond this point the victim succumbs—and that the way to thin shrubs is to look beyond the twigs that are too numerous down to the branch or stalk whence they spring—to go right down to the ground and cut out old wood.

This illustrates a combination of good and bad pruning. Though the wounds have been made close enough to the trunk and are healing properly, the branches are so trimmed that they have not been allowed to spread sufficiently, and thus the tree is headed too high



The permanent hotbed when the weather permits removing the sash through part of the day

Hotbed soil showing bed before manure is worked in (to left of bar), and after the manure has been worked under (to right of bar)

X

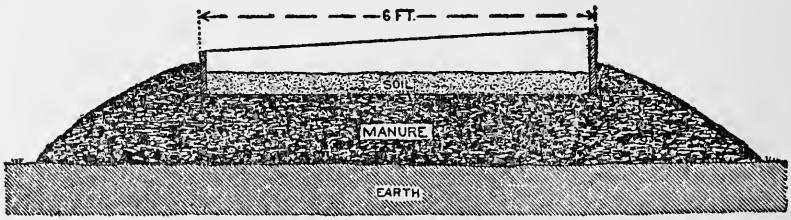
THE HOTBED AND THE COLDFRAME

EVERY garden beginner is eager to begin at once—to have things growing as soon as possible—and so, because a hotbed will advance the season anywhere from eight to ten weeks, he will early wish to learn something about making one. They are simple enough, and plain directions, carefully heeded, will bring success even to the novice. Do not hesitate to try one therefore—you will surely resolve never to do without such a simple and wonderfully useful aid to the pleasure of planting.

A hotbed is really a forcing house on a very small scale—a place where plants may be grown in advance of the open season by means of heat artificially supplied to them. This heat may be carried underneath the bed by steam or hot water pipes, but that is the bothersome and expensive way; or it may be furnished by placing the bed upon a mound of fermenting manure. This is the easiest and usual way, and the only one that need concern the beginner.

Fresh manure from the stables of grain-fed horses, mixed with one-third bedding straw (this latter lengthens the heating period), should first be piled in

the protected spot chosen for the bed's location—a place where the north winds cannot reach. If the manure is dry, sprinkle it with tepid water to start decomposition.



Cross-section diagram of a Hotbed.

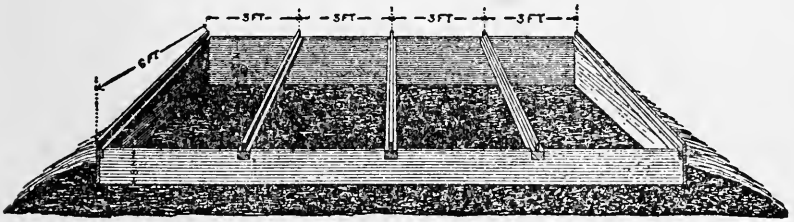
Steam will begin to rise from the pile in from three to five days. As soon as it appears have it well worked over, turning the outside inside and bringing the inside to the surface—then let it alone to warm up again. This will take two or three days more—the presence of the steam will indicate that it is ready, when the work may proceed.

Spread the manure evenly over an area large enough to give a full two-foot margin all around outside the sash or sashes. Make it 18 inches deep—this for the latitude of New York City; have it proportionately deeper and broader in colder localities—and pack it firmly. On this flat pile set the frame to carry the sash.

This frame is a bottomless and topless box made of two-inch planks; it should slope on top from a height of about 12 inches at the front to 18 or 24 inches at the back, with the sides slanted to conform to the

slope. Its ground dimensions are regulated by the size of the sash it is to have as its top or covering—so, as a matter of fact, the first thing to do in making a hotbed is to get the sash.

Any old sash will do, whatever its shape or size. Glazed for a window, it will doubtless leak when put to this more trying use, but if it is reasonably tight the plants under it will not suffer. Lacking a discarded sash, regulation hotbed sash will, of course, be necessary, but these are inexpensive. They are glazed differently, however, from the ordinary window-sash—and the way of doing it ought to be among the gardener's accomplishments, for breakage is apt to occur.



This shows the construction of Hotbed frame to receive sash.

The bars of these sash run lengthwise only, as you will see from the accompanying illustration, and are "rabbeted" to receive the glass. Spread soft putty along this rabbet, then, starting at the bottom of the sash, press the first pane down into the putty; fasten it with brads—the glazing points not being strong enough. Let the pane lap over the wood at the bottom rail half an inch, forming a watershed, and lap each

succeeding pane over the preceding one by half an inch, in the way shingles are overlapped in roofing. A brad under each lower corner will keep the panes from slipping down.

With the hotbed placed upon the packed manure (the back or high end to the north always), proceed to bank up on the outside with more manure—quite up to the level of the lower or front edge. Then spread the soil, which is to be the actual seed bed, inside, making it from four to eight inches deep according to what you intend to grow. The shallower depth is quite sufficient for salad or for flower plants—only radishes and deeper growing root crops require the deeper bed. The planting soil of the hotbed should be rich and soft and friable—good garden earth with a mixture of sand is best.

Put the sash on the bed, and let it heat up the earth inside. It will be hot for three or four days—much too hot, at first, for any planting. Keep a thermometer inside the frame; do not begin planting until it drops to 90° F. or less.

As the plants must remain in the bed for two months it will be necessary to thin out the seedlings to make room therein. This should be done as soon as they appear in order to give the ones spared plenty of room to develop right from the start. Some of the plants may later be transferred to the coldframe if it is too early for them to go out into the garden and the hotbed becomes overcrowded.

The garden beginner will do well to fit up a convenient work bench somewhere, for there is a deal of puttering to be done at seed time, and when transplanting begins

After you have prepared the soil in hotbed or coldframe mark off your planting rows carefully and neatly

The hotbed should be watered with a sprinkler, keeping the soil just moist enough to crumble apart slowly after being squeezed in the hand, as described in the chapter on the soil. Be sure that the sash is always in place after you have tended the bed—forgetting to replace it will result in plant tragedy. And be sure to ventilate the hotbed on warm days by raising the sash ever so little, or by slipping it down in the middle of the day,—between 11.30 and 1.30, when the sun is shining directly on the glass.

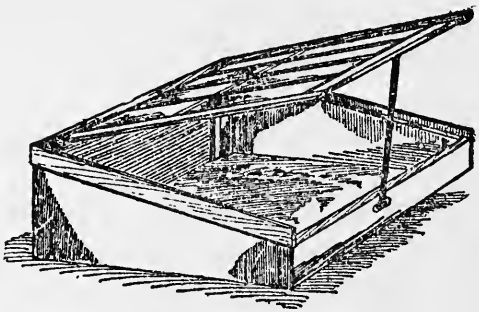
Till the soil of the hotbed as you would anywhere in the garden—only do not keep the sash off for any length of time. Reach under to do the work. Nasty little green things that look like lice will probably appear—beastly, soft, smushy aphids they are. They revel in hotbeds, but a solution made of one-quarter pound of white soap dissolved in a little boiling water and then reduced in strength by adding five gallons of water, used tepid in a sprayer, will make short work of them. They will come again, no doubt—but vigilance will save the crop from their devastating armies. Fortunately they die easily—almost as easily as they come. They are often on the under side of leaves and unsuspected until the leaf curls—and then unseen because of their color. Keep a sharp watch for them. Other insect and fungous pests and how to get rid of them will be taken up in a later chapter.

A mat of straw or several thicknesses of burlap should be provided to cover the sash on cold nights—and it is seldom wise to build the bed before

the last week of February or the early part of March. If ready by March 10th you will find it early enough for all practical purposes—and the plants in it will be big fellows by the time the ground is warm enough outside to receive them.

Unless the space it occupies is needed during the summer the bed may be left and used for a coldframe in the fall, for lettuce or other salad plants.

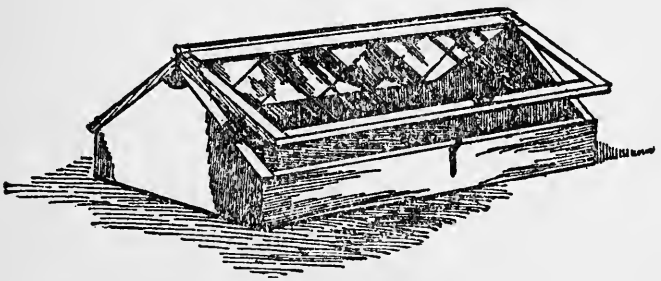
The coldframe differs from the hotbed in that it is constructed without an underpit of heat-producing materials, and is intended merely to provide greater protection from cold and winds for growing plants. It is made of a board frame set on top of the ground, not in-sunken like the hotbed, but like a hotbed it has a protective sash over the top to cover it.



Usual form of Coldframe.

Its usefulness in the beginner's garden can scarcely be overestimated, for by having a coldframe at hand the garden-maker may be sure of early salad plants and, in a small way, be far in advance with melons and cucumbers.

Likewise the coldframe serves the garden-maker as a winter protection for tender plants that will not stand wintering in the North, while very often it happens that the hotbed becomes overcrowded. In this event the coldframe is an especially valuable adjunct to its usefulness inasmuch as the plants from the thinned-out hotbed need not be lost, but instead may be saved by being set into the coldframe for intermediary growth against the time when the natural outdoor garden is ready to receive them.



Coldframe with double sash.

As their cold-proof qualities is their reason for being, these coldframes, no matter how simple, must be carefully, constructed in order that the parts where there is any joinery may be weather-proof. The accompanying illustration will show, at once, the sort of a structure the garden beginner may require for his initial experiments with early-raising. Not only will the hotbed and coldframe serve the grower of early vegetables, but will also promote the success of the flower garden, and make possible earlier flowers,

and the bloom of certain perennials their first season that could not be accomplished without recourse to this phase of gardening.

XI

GARDEN PESTS AND SPRAYING

EVERY beginner is apt to meet the discouragements that come with the appearance of insect and fungous pests in nearly every garden at some time. You may wonder why your lovely flowers or your fat vegetables, your stately Hollyhocks or your practical potatoes seem, of a sudden, not only to stop growing but actually to wither or decay. You will have to look closely at their leaves and search around their roots for the trouble that is brewing. You will find that insects or fungous growths have appeared to disturb their peace. Indeed almost every plant under cultivation is subject to some blight or pest from which, in its wild state, the plant has been free.

However, there is now hardly a single plant ailment that we are either unfamiliar with or unable to cope with, wherefore liquid spraying, or the application of liquid fungicides and insecticides to affected trees, shrubs, vines, and plants, has become an expedient of the greatest importance to everyone having a lawn or garden. It is a disheartening thing to see the plants you have worked over and nurtured turn sere-leaved out of season, droop and die, when you have looked forward

to their mature beauty and usefulness with all the hope the heart of a garden-maker can hold.

Fungous plant-diseases are quite as much to be dreaded as attacks from insect foes upon plant life. We can hardly cure their mischief, but, to a great extent, we can prevent their occurrence by spraying and, in some measure, check the spread of blight or anthracnose likewise.

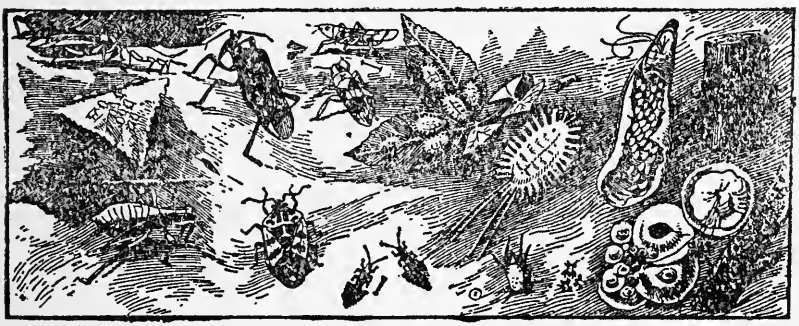
As only a microscope will disclose to us just where the minute fungi spores are lodging themselves, it becomes necessary to prevent the possibility of their appearing at all, even if, in seasons past, our trees and shrubs and vines and plants seem to have been free from disease. Not only must they be sprayed once but often, as the effect of liquid spraying (which has great advantage over dust spraying) is cumulative. The first spraying may not reach tiny spores tucked away in budding portions of the plant, which, when these come into branching proportions then present the disease upon a surface that must be reached by subsequent spray application. Nevertheless all the spraying in the world will be rendered futile if your neighbor's trees, shrubs vines or plants are diseased and still do not receive like attention. Therefore one of the first things to do is to prevail on him to have his spraying done coincident with yours, and if he remains indifferent to the matter it is far better for you to bear the expense of doing it for him than to subject your trees to danger from contamination. Indeed, the matter of communal effort in this direction is of such importance that many

neighborhood societies of garden owners have been formed, and out of the common treasury the expenses of

Types of chewing insects.

neighborhood spraying have been borne, thus establishing one of the most helpful coöperative movements known for the maintenance of fair areas.

Insect pests may be divided into two general classes of external feeders—insects that injure the plants by biting or gnawing (these must be got rid of by poisoning their food), and insects that destroy



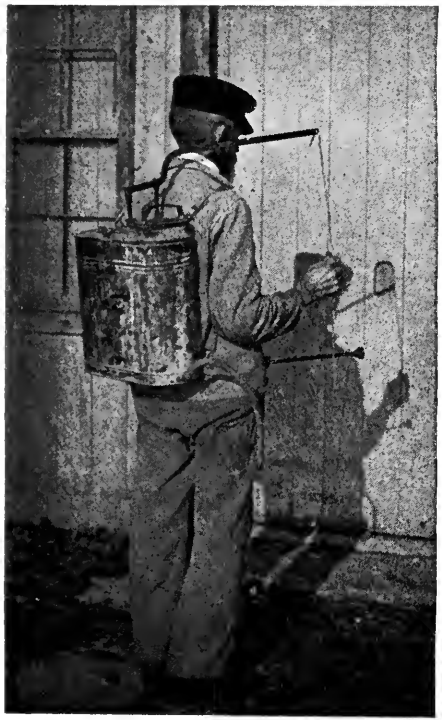
Types of sucking insects.

plant life by sucking the juices of the plants (these latter must be met openly and killed by penetrating external poisons, fume suffocation, etc., as they pay no attention to mere surface poisons).

In the first class we have the Flea-beetle, the Potato-bug, the Cabbage-worm, the Cinch-bug, and various other beetles and injurious larvæ, also Grasshoppers. Among the second class are to be found the moth parents of the Cut-worm, the Tassel-worm, the white Grub-worm's moth, the Onion-maggot, Maple-borer and Rose-bug.

Spraying is easily accomplished even on the smallest premises. Excellent and inexpensive apparatus is offered in the market (your florist or your nurseryman can always supply you with reliable manufacturers' addresses). The pump should be strongly made, and one nozzle will be sufficient. You will probably have to renew the spraying hose every year, if you have much work to be done. If you have a large garden you can rig up a barrel on wheels, for moving the Bordeaux Mixture or other arsenate sprays around, and fit it with pump hose and nozzle at a total cost of ten dollars.

For a small garden a hand sprayer costing, say, four dollars, is sufficient. The knapsack style of sprayer, carried by straps on the shoulders, is especially good and will throw a spray fully fifteen feet. This can be used to equal advantage on fruits and vegetables. With heavier sprays, such as Paris green and Lime-sulphur wash, agitation is necessary to keep the com-

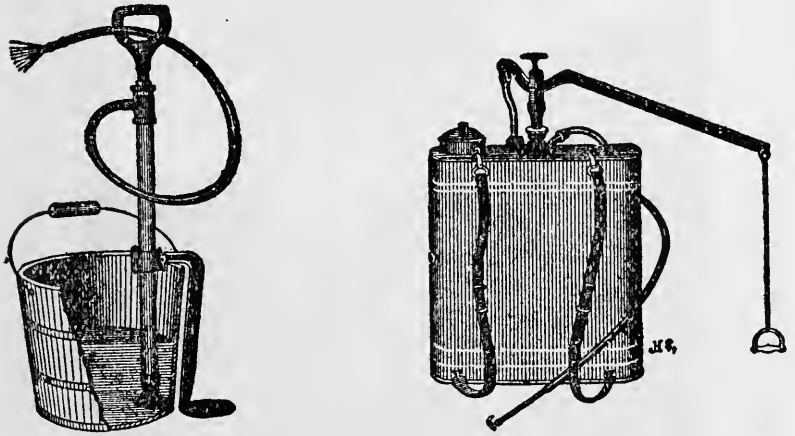


Knapsack pump-sprayer holding five gallons

These are the various sorts of sprayers and accessory apparatus useful to the garden beginner

Because Hollyhocks and many other plants
are subject to plant diseases and insect
pests the garden beginner need not
be frightened away when such
lovely flowers as these may
be brought to maturity
with very little trou-
ble after all

pound properly mixed, and many mixtures should be strained before using thus for Lime-sulphur a strainer of not more than twenty meshes to the inch is necessary (a smaller mesh would fill up). The nozzles must be kept from clogging.



Bucket Hand-Sprayer and Knapsack Hand-Sprayer.

In spraying, as high a pressure as possible is advisable, as the mist-like spray produced thereby reaches every part of the plant. Indeed thoroughness in spraying is one of the essentials to successfully combating plant pests, for any hit-or-miss program renders the final result of little lasting value.

Timeliness in spraying is a matter of the utmost importance. The garden-maker should make his preparations early, and from time to time study up the subject so he may be forewarned as well as forehanded. One good way to keep posted on such matters is to study the catalogues of manufacturers and by reading

agricultural bulletins, as year by year spraying apparatus is improved and simplified, and many valuable spraying formulæ are produced to combat with success new plant pests. The accompanying table is, for all general purposes, a safe calendar of spraying operations to use as a guide.

The following recipes are some of the more common ones in general use:

INSECTICIDES

1. *Arsenate of Lead.* Use 4 oz. to 5 gals. of water.

2. *Paris Green.* Use 1 part Paris green to 5 gals. water.

3. *Kerosene Emulsion.* ½ lb. soap dissolved in 1 gal. boiling water. Add 2 gals. kerosene; agitate 5 minutes. Dilute a dozen times before applying with spray.

4. *Lime-sulphur.* Use unslaked lime 5 lbs., flowers of sulphur 3¾ lbs., salt 1 lb., water 12 gals.

5. *Arsenite of Lime.* Use white arsenic 1 lbs., Crystal sal soda 4 lbs. (or if of the *anhydrous* sal soda, only 2 lbs.), to 1 gal. of water.

6. *Ammoniacal Copper Carbonate.* Use Copper carbonate 5 oz., Ammonia (26° Beaumé) 3 pints, water 45 gals.

7. *Whale-oil soap.* Dissolve 2 lbs. in 1 gal. hot water. Dilute 4 times before spraying.

8. *Formalin Spray.* Use 1 pint Formalin to 30 gals. water.

9. *Copper Sulphate.* Use 1 lb. Copper sulphate to from 25 to 50 gallons of water.

FUNGICIDES

10. *Bordeaux Mixture.* Use 5 lbs. Copper sulphate, 5 lbs. unslaked quicklime, and 50 gals. water. Slake lime wi h water to a thin paste and strain this. Place lime paste and Copper sulphate in jug and mix thoroughly by shaking. Then add this to full quantity of water. Any arsenites to be combined with Bordeaux mixture may be added as required.

11. *Sulph de of Potassium.* Use 4 oz. of potassium sulphide to 5 gals. water. Dissolve sulphide in warm water and dilute to spraying strength. Use only when fresh as it soon loses strength.

The following names of insect and fungous pests are followed each by the number of the recipe for the spray to use in coping with it:

INSECT PESTS

Aphids (Plant Lice) 5; Borer 10; Canker Worm 2; Codlin Moth 5, 9; Cottonwood-leaf Beetle 5; Cutworm 5; Elm Beetle 5, 3; Elm Scale 3; Fall Webworm 5; Four-striped Plant-bug 3; Hollyhock Bug 3; Leaf Cutter 3; Maple Borer 11; Maple Cotton Scale (Wooly Scale) 7; Mealy Bug 7; Mite 3; Oyster shell Scale 3, 4; Red Spider 3; Rose Bug 1; Roseleaf Hopper 7; Rose Scale 3; Rose Slug 6; San José Scale 3, 7, 4 (winter); Scurfy Scale 3, 7, 4 (winter); Tussock Moth 2; Willow Worm 5.

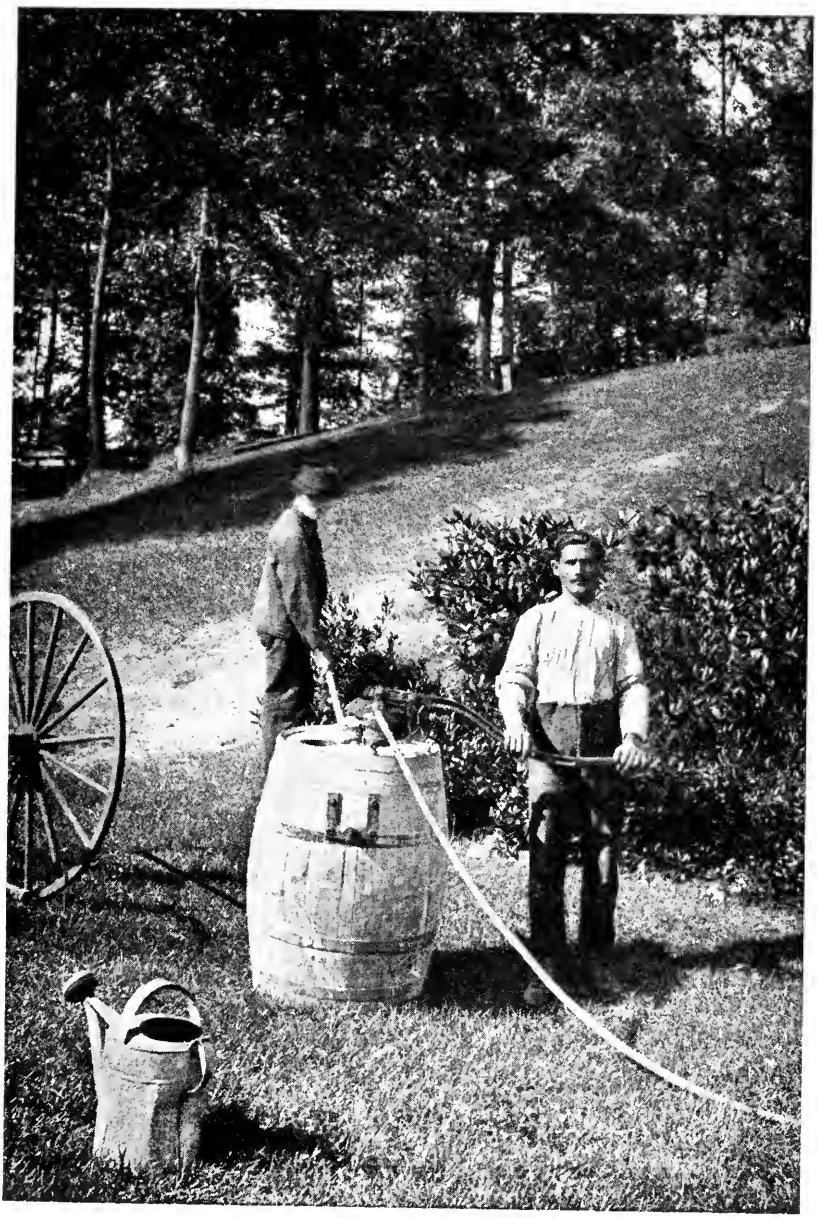
FUNGOUS PESTS

Anthracnose 10; Chrysanthemum Leaf-spot 10; Hollyhock Rust 10; Leaf Blight 10; Leaf-rust 10; Maple Leaf-spot 10; Mildew 10; Pansy Rust 10; Rose Leaf-blight 10; Rust 10; Verbena Rust 11.

For the Borer paint the trunk of trees with lime-wash, containing 5 oz. of Paris Green to each gallon of water. For ants pour a teaspoonful of bisulphate of carbon in each ant-hole and cover up. The chewing insects that injure our ornamental trees may be destroyed by arsenite sprays, but the sucking insects must be smothered by such sprays as the whale-oil soap (7), kerosene emulsion (3), or the lime-sulphur solution (4).

One of the greatest aids to freedom from fungous and insect pests is cleanliness in the garden. See to it that your lawns, yards, orchards, gardens, borders and all are free from rubbish, especially free from vegetable matter, such as old tree-twigs and plant stocks that have died from abnormal causes. As a stitch in time saves nine so does the spraying of one infected plant often save all of them from total destruction. Therefore it is well for the amateur gardener, as well as for the professional, to have always at hand some convenient and ready reference for emergencies.

The garden beginner will find the Tables of First, Second, Third and Fourth Spraying, with key to Insecticides and Fungicides to use, at the end of this volume (pages 112 and 113), and it should prove a handy and reliable table for reference.



When there are extensive spraying operations to be attended to the barrel pump-spray, moved around on a pair of wheels, may be resorted to, but the garden beginner can probably dispense with this the first season, unless he takes hold of a big lawn, grove, and garden

The wheelbarrow, spade, hoe, rake, trowel and watering pot are the gardener's friends. We see what faithfulness to their use has helped to produce here

XII

GARDEN TOOLS

AS one cannot have a good garden without cultivating it, there cannot, in turn, be good cultivation without good tools. By good tools, the beginner will come to understand, is meant useful tools. They need not be elaborate, expensive and intricate affairs, but neither need they be as clumsy as the implements of the aborigines.

In gardening you dig up the soil, pulverize it, and work it over. Hence you will need a spade (or a garden trowel for a small bed), a rake (or a gardening hand rake for a small bed), and a hoe (or again the garden trowel for a small bed) in cultivating. None of these things can well be dispensed with because they are primitive in principle and yet eternal in usefulness.

When you have turned over the soil with the spade or trowel, have pulverized it, more or less, with rake or hand-rake, and have had your seeds in the ground until they are just appearing, you will find the hoe (or a hand weeder in small beds) necessary in checking the weeds, which always seem to outdistance the garden plants in growth rapidity.

For the larger garden of vegetables in rows the wheel-hoe is one of the most worth-while tools ever invented. It combines weeding and cultivating and is so simple in its principle that one may recommend its use to the beginner who need have no fear of its being a complicated machine, requiring vast experience to run it.

As a gardening accessory a garden line will be of great service. By its use, stretched between movable stakes, the beginner can lay out his rows straight as any arrow, and have rectangular beds that are not lop-sided. Then by driving a stake in the center, and throwing a loop of the line around it, when once he has fixed the length of the radius, he can move the line around in a circle and thus mark out a perfect circular bed.

Then there is the watering-pot to be thought of, unless hose and nozzle you have at hand. Hand-sprayers can be purchased if your plants are troubled by pests, but all these things can be added as necessary. A few good tools is all anyone need bother with, though it will pay the garden beginner to read over the catalogues of garden-tool manufacturers and keep abreast of all the devices on the market, as some one of them may fit some especial need.

XIII

THE FLOWER GARDEN

THE making of a successful flower garden is not a matter to be left to chance, and perhaps it is one of man's inconsistencies that he is willing to dig and delve for a vegetable, while, more often than not, he begrudges the care he should give a Verbena, as though the satisfaction of a sense of the beautiful should not have half a chance with one's appetite. Now there is scarcely anyone who does not care for flowers, although it must be admitted there are many who give them little enough thought.

With the first breath of every spring and the return of the birds from their winter holiday, one begins to feel an enthusiasm for making just as good resolutions as every New Year's day brings forth. Among them no one is more fitting to the happiness of living than a resolve to have a flower garden. The joy of it will always repay the trouble of it a thousand times over.

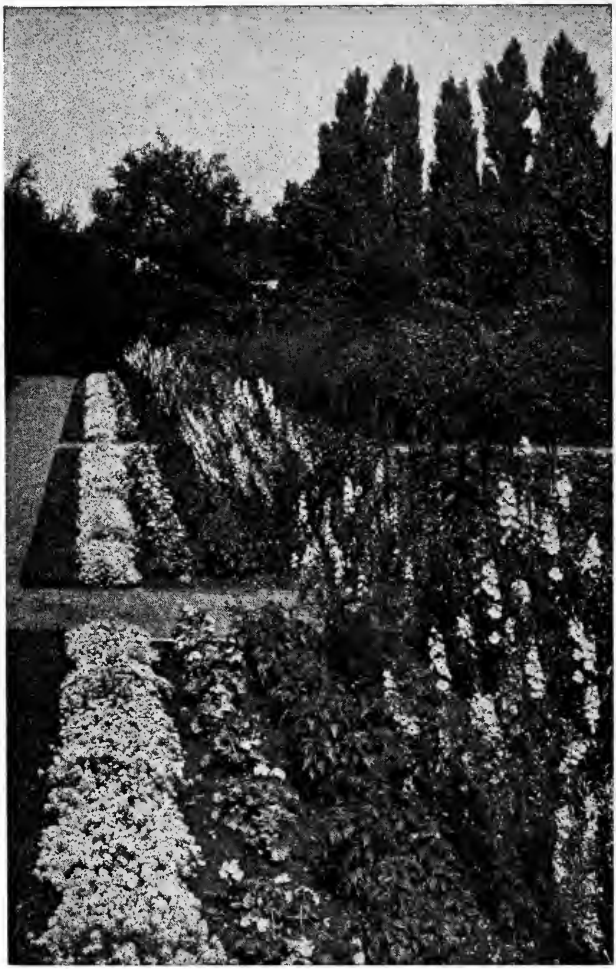
In the preceding pages the garden beginner will have learned about garden soils and their preparation, seeds, transplanting, and the care of mature plants, as

well as all that it is necessary for him in the beginning to know about fertilizing. Therefore, what to plant becomes a matter of moment, as also a hint that such flowers as Candytuft Love-in-a-mist, Lupine, Mignonette, Nasturtium and Poppy will not bear transplanting.

As the garden beginner has learned, Perennials seldom blossom until the second season after planting from seed, and so the annuals are the plants to which the amateur gardener turns when in need of flower effects for the first year of his experimenting. However, lateness in season need not deter one from having a garden even if it is long past seeding time. Grown plants may be obtained from the florist, and after these plants have found themselves at home in your garden they will increase, with care, year after year, until you in turn will be able to exchange with your gardening neighbors. Thus one may have all sorts of beautiful flowers in his first year's garden.

The accompanying table is designed to guide the beginner at flower gardening to the standard annuals and perennials everyone may grow almost anywhere. It indicates time of sowing, blossoming, etc., which information everyone planting a flower garden will find most useful to have for reference. For all general purposes the plants in this table have been divided into perennials, annuals, and biennials, indicated by the letters P, B, A. Many of the perennials may be treated as annuals, certain annuals as biennials and certain biennials as annuals. Therefore, some of the species in

Why not make the border in the clothes-yard by the back fence just as lovely as the garden in front of your house? Anyone can learn to do it



A well-kept border of Annuals and hardy Perennials is a joyous sight in every perfect garden, and is something the garden beginner should strive to imitate

the list are prefixed by two or more letters. As the Chimney Bell Flower (*Campanula pyramidalis*), Rocky Mountain Columbine (*Aquilegia cærulea*), and Iceland Poppy (*Papaver nudicaule*), are so short-lived at best, they are, for instance, to be treated as biennials.

As the wise among mankind are those to whom far-sightedness is sure to bring its rewards, so, among gardenkind, looking ahead will help one along the pleasant paths of garden making. Everyone should try to picture the garden as it will appear in its wealth of bloom, long after the dull-colored earth has donned its garb of green and gorgeous color. If he garden maker will do this he will not wake up to find that he has planted scarlet Gladioli next to delicate p nk Cosmos, purple Iris next to blue Campanula, nor mixed the exquisite Love-in-a-mist with blatant Zinnias.

XIV

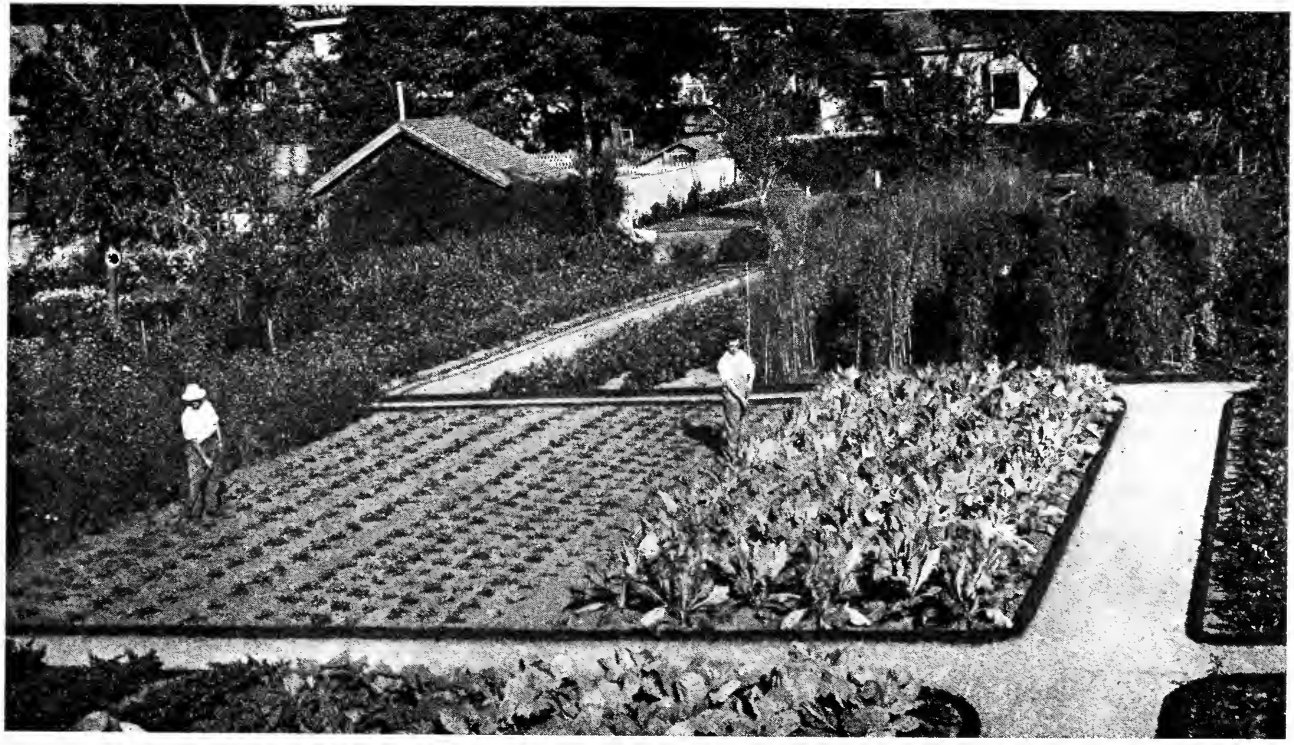
PLANTING TABLE OF THE BEST FLOWERS FOR THE GARDEN

PLANTING TABLE OF THE BEST FLOWERS FOR THE GARDEN

P Indicates hardy or tender perennials. ¶ Indicates flowers good for cutting. ‡ Indicates climbers. ° Indicates self-sowing annuals.
B Indicates biennials. * Indicates especially fragrant flowers. ‖ Indicates plants thriving with partial shade.
A Indicates annuals. § Indicates plants for moist places. † Indicates time for setting out perennials.

Key	Plant	Color	Height (inches)	Sow	Depth for Seed (inches)	Distance of Plants Apart	Blossoms (early and late)	Landscape Use
						inches		
P	Aquilegia†‖ (Columbine)	Various	12–24	¶May		12	June-July	Mass-border
P	Achillea	Various	12–36	¶May		10	July	Border
P A	Adonis	Yellow	12	April ¶ May		6	May-June	Border
A	Ageratum†‖	Blue white	24	May	¼	5	June-Oct.	Mass-edging
P	Anemone†	White to rose	12–36	¶May		12	Aug.-Oct.	Mass-border
A	Aster†	Various	12–18	May	¼	12–15	July-Sept.	Mass-edging
A	Bachelor's Button†°‖	White-blue-pink	15–20	May	¼	6	July	Border
A	Balsam	Various	10–18	May	¼	15	June-Sept.	Mass-border
P	Bleeding-Heart (Dicentra)	Crimson-purple	8–19	¶May		24	May-Aug.	Mass
A	Calendula	Orange-yellow	22–24	May	⅛	12	June-Oct.	Mass-border
A	California-Poppy	Orange-yellow	12	May	⅛	8	August	Mass-edging
P A	Campanula	White-blue-pink	18–36	May ¶ July	¼	8	June-July	Border
A	Candytuft†	White	6–8	May	⅛	4–12	June-Sept.	Mass-edging
A	Castor Bean	Foliage	60–90	May	¾	36	Foliage	Screen-ornamental
P A	Chrysanthemum†	Various	12–36	May	⅛	18	Aug.-Oct.	Mass-border
A	Clarkia†	White-rose-purple	18	May	¼	8	June-Sept.	Mass
A	Cockscomb	White-red-yellow-purple	6–12	May	¼	8	June-Oct.	Border
P	Coral Bell‖	Coral red	12–30	May		15	July-Aug.	Border
A	Coreopsis†°	Yellow-brown	12	May	⅛	12	June-Aug.	Mass
A	Cornflower†	White-blue-rose	12	April	⅛	8	June	Mass
A	Cosmos†°	White-pink-red	24–72	May	¼	24	Aug.-Sept.	Mass
P	Dahlia	Various	2 to 4 ft.	May		36	July-Sept.	Mass
P	Daisy	White-pink-rose	6–8	May		6	May	Edging
P	Evening Primrose	Yellow	60	¶May		10	July-Aug.	Edging
P B	Forget-me-not§	Blue	6–18	May ¶ May	¼	6	April-July	Edging
P A	Four-o'clock°	White-red-yellow	30	May ¶ May	¼	10	July-Aug.	Border
P B	Foxglove§‖	Pink-white	10–36	May ¶ May	⅛	10	June	Mass-screen
P	Gaillardia†	Red-yellow	36–60	¶May		12	July-Oct.	Mass
A	Globe Amaranth†	Pink	18	May	¼	10	July	Mass-border
A	Godetia†‖	Red white	12–24	May	⅛	8–12	July-Oct.	Mass
A	Gourds	Various colored fruits	5 to 15 ft.	May	¼	12	July-Oct.	Mass

P	Heliopsis	Yellow	36–48	¶May	½	8–12	July	Mass
P	Helianthus§	Yellow	2 to 10 feet	¶May			Aug.-Sept.	Ornamental
B	Hollyhock	White to rose-yellow	36–6 ft.	August	In drills ½ in.	12–16	August	Screen
P A	Iceland Poppy	White-yellow to orange	15	May ¶ May	¼	5	June-Sept.	Mass
A	Iris*	White-yellow-blue	18–30	¶May	½	8–12	May-July	Mass-border
P A	Larkspur†°	White-blue-pink	12–60	May ¶ May	¼	6 to 10	June-July	Border
A	Lavatera	Rose	36–72	May	½	8	July	Screen
A	Lobelia§†‖	Blue-crimson	6–12	May	¼	3	June-Sept.	Mass-edging
A	Love-lies-bleeding°	Yellow to scarlet	36–60	May	½	10	June-July	Mass
A	Love-in-a-mist°	White-blue	12–24	May	½	10	June-Sept.	Border
P A	Lupine†‖	White, blue, pink	12–24	May ¶ May		4	June	Mass
P	Mallow§	Rose-white	18–30	¶May		8	July-Sept.	Mass
A	Marigold†°	Lemon to orange	10–24	May	½	6	Aug.-Oct.	Mass-edging
A	Mignonette*†	Green white	12	May	¼	6	July-Oct.	Mass-edging
P	Monkshood‖	Blue-white	36	¶May		10	July-Aug.	Border
A	Moonflower‡	White	15 to 30 feet	May	½	6	Aug.-Sept.	Screen-vine
A	Morning Glory‡°	Various	10 to 20 feet	May	½	4	July-Aug.	Screen-vine
A	Nasturtium*†‡	Various	1–60	May	½	5–12	July-Oct.	Mass-screen
A	Nicotiana*†‖	White-red	3 to 5 feet	May	½	8–12	July-Aug.	Mass
P A	Pansy†‖	Various	6	May ¶ May	¼	7	May-Oct.	Border
P	Peony†	Red-pink-white	24–36	May			May-June	Mass
A	Petunia°	White to claret	12–24	May	Scatter seed	8–12	July-Sept.	Mass-edging
P A	Phlox†	All except blue & yellow	12–60	May	¼	8–12	July-Oct.	Mass-edging
P A	Pink†	White to rose	4–12	April ¶ May	¼	5	August	Border
A	Poppy†°	White to scarlet	6–24	May	¼	4	July-Aug.	Mass
A	Portulaca°	White-red-yellow	6–9	May-June	¼	4	July-Oct.	Mass-edging
P	Primrose	Yellow-pink	4	¶April		5	April-May	Mass-border
P	Pyrethrum†	Various	12–24	¶May		12	Aug.-Oct.	Mass-border
P	Rudbeckia†	Yellow	60–100	¶May		12	Aug.-Sept.	Mass-screen
A	Salpiglossis	Various	12–24	May	¼	6	June-Aug.	
P A	Salvia†°‖	Scarlet	10–24	May ¶ May	¼	5	Aug.-Oct.	Mass-border
P	Scabiosa†	White-yellow-blue	12–36	¶ May			June-Aug.	Border
A	Schizanthus	Mixed yellow-lilac	24	¶May	½	8	July-Aug.	Border
P	Silene†	White to rose	3–5	¶May		5	June-Aug.	Mass-edging
P A	Snapdragon†	Various	24	May ¶ May	¼	8	July-Aug.	Mass-border
A	Stock†	White to crimson	18	May	¼	5	June-July	Border
P A	Sunflower§°	Yellow	36–100	May ¶ May	½	24–48	August	Screen
A	Sweet Alyssum†°	White	8	May	¼	4	May-Sept.	Mass-edging
A	Sweet Pea*†‡	Various	1 to 6 ft.	April	Trench 3	8	June-Oct.	Screen
P B	Sweet William	White-pink-red	12	May ¶ May	½	8	July-Aug.	Border
P	Verbena†	Various	5–18	¶May		12	June-Aug.	Edging
P	Veronica	Purple	24–30	¶May		8	August	Border
P	Violet*§‖	Violet	6 in.	¶May		6	March	Mass-edging
P B A	Wallflower*	Brown-yellow	12–30	May ¶ May	¼	6	July-Aug.	Border
A	Zinnia†	Various	12–24	May	¼	8	July-Oct.	Mass



There is no reason why the Vegetable Garden cannot vie with the Flower Garden in the matter of neatness. A garden like this is one to be proud of, and patience and care did it all

XV

THE VEGETABLE GARDEN

THE prose of gardening—vegetable-raising—is quite as interesting as its poetry—flower culture, when it is well done. There is nothing that gives one a greater satisfaction than a model vegetable garden, no matter how small it may be. The old notion that vegetable seed had merely to be stuck in the ground to come forth fruitfully for the family table has long since been dissipated by the knowledge that no plants require more careful attention and more good common sense in starting them and in bringing them to maturity than do vegetables.

Nevertheless any garden beginner who has profited by what he has learned in these pages has only to apply the information thus gleaned to the making of a vegetable garden. The appended tables will be of great service to the amateur gardener, and by following these directions, and broadening his knowledge by the actual experience he will derive from his first year's garden, raising vegetables will no longer be a thing that seems fraught with more difficulties than appear worth while coping with. Instead, after he

has once started his vegetable garden, and has brought its produce to the happy stage of maturity there will be instilled in his gardening soul an enthusiasm for these marvels of patience and good soil that will lead him, year after year, to repeat his garden making, but to avoid his mistakes.

In order that the garden beginner may make fewer of these mistakes the appended tables of what vegetables to plant, and their various directions, have been prepared, being the recorded result of mature experience in vegetable gardening.

XVI

PLANTING TABLE OF BEST GARDEN VEGETABLES

PLANTING-TABLE OF BEST GARDEN VEGETABLES

Vegetable	When to sow or plant[1]	Depth to sow in ins.	Distance		Seed or plants for 50-ft. row	No. days to germinate	No. days to mature
			Apart in rows[3]	Rows apart			
I. Crops Remaining Entire Season.							
Asparagus, seed.	April-May.....	1	2-4 in.	15 in.	1 oz.	20–30	3 years
Asparagus, plants	April.....	4	1 ft.	3 ft.	50	—	1 year
Bean, pole.....	May 15-June 10..	2	3 ft.	3 ft.	½ pt.	6–10	65–100
Bean, lima.....	May 20-June 10..	2	3 ft.	3 ft.	½ pt.	6–10	60–90
Beet, late.....	April-August.....	2	3-4 in.	15 in.	1 oz.	7–15	75–90
Carrot, late.....	May-July.....	½–1	2-3 in.	15 in.	½ oz.	10–20	90–120
Corn, late.....	May 20-July 10..	2	3 ft.	4 ft.	½ pt.	4–10	80–100
Cucumber	May 10-July 15..	1	4 ft.	4 ft.	½ oz.	4–15	60–85
Egg Plant, seed.	June 1st.....	½	3-6 in.	15 in.	¼ oz.	6–12	125–150
Egg Plant, plants	June 1-20.....	—	2 ft.	2½ ft.	25		
Leek	April.....	—	2-4 in.	15 in.	½ oz.	6–20	120–150
Melon, musk.....	May 15-June 15..	1	4 ft.	4 ft.	½ oz.	6–20	90–120
Melon, water ...	May 15-June 15..	1	6-8 ft.	6-8 ft.	¼ oz.	6–20	100–125
Onion	April.....	½–1	2-4 in.	15 in.	½ oz.	15–25	120–175
Okra	May 15-June 15..	½–1	2 ft.	3 ft.	½ oz.	10–20	100–125
Parsley[4].....	April-May.....	½	4-6 in.	1 ft.	½ oz.	15–25	90–110
Parsnip	April.....	½–1	3-5 in.	18 in.	¼ oz.	12–18	100–150
Pepper, seed.....	June 1st.....	½	3-6 in.	15 in.	½ oz.	6–15	125–150
Pepper, plants .	June 1-20.....	—	2 ft.	2½ ft.	25		
Potatoes, main..	April 15-June 20.	4–6	13 in.	2½ ft.	½ pk.	15–20	75–100
Pumpkins	May 1-June 20...	1–2	6-8 ft.	6-8 ft.	¼ oz.	6–10	100–150
Rhubarb, plants.	April.....	—	2-3 ft.	3 ft.	25		1 year
Salsify	April-May... ...	1	3-6 in.	18 in.	¾ oz.	8–15	125–150
Squash, summer	May 15-July 1...	1–2	4 ft.	4 ft.	¼ oz.	6–10	60–75
Squash, winter ..	May 15-June 20..	1–2	6-8 ft.	6-8 ft.	¼ oz.	6–10	100–125
Tomato, seed....	June.....	½	3-4 in.	15 in.	½ oz.	6–12	125–150
Tomato, plants..	May 15-July 20..	—	3 ft.	3 ft.	20		
II. Crops for Succession Plantings.							
Bean, dwarf	May 5-Aug. 15...	2	2-4 in.	1½-2 ft.	1 pt.	6–10	45–75
Endive[4].....	April-August.....	½	1 ft.	1 ft	½ oz.	5–10	75–100
Kohlrabi[4]	April-July.....	½–1	6-12 in.	1½-2½ ft.	¼ oz.	6–10	65–85
Lettuce[4]..	April-August....	½	1 ft.	1-1½ ft.	50	5–15	75–100
Peas, smooth....	April 1-Aug. 1...	2–3	2-4 in.	3 ft.	1 pt.	5–15	50–65
Peas, wrinkled..	April 10-July 15.	2–3	2-4 in.	3-4 ft.	1 pt.	5–15	60–75
Radish.....	April 1-Sept. 1...	½	2-3 in.	1 ft.	½ oz.	3–10	25–50
Spinach	April-Sept.15.....	1	3-5 in.	18 in.	½ oz.	6–15	60–75
Turnip	April-Sept.	½–1	4-6 in.	15 in.	½ oz.	3–8	60–75
III. Crops to be Followed by Others.							
Beet, early.....	April-June.....	2	3-4 in.	15 in.	1 oz.	7–15	60–75
Broccoli, early[4]..	April.....	½–1	1½ ft.	2 ft.	35	5–10	100–140
Borecole[4]	April.....	½–1	2 ft.	2½ ft.	25	5–10	85–120
Brussels Sprouts[4]	April.....	½–1	1½ ft.	2 ft.	35	5–10	100–140
Cabbage, early[4]..	April.....	½–1	1½ ft.	2 ft.	35	5–10	100–125
Carrot.....	April.....	½–1	2-3 in.	15 in.	½ oz.	10–20	60–80
Cauliflower[4].	April.....	½–1	1½ ft.	2 ft.	35	5–10	100–115
Corn, early.....	May 10-20.....	2	3 ft.	3-4 ft.	½ pt.	4–10	60–80
Onion Sets.....	April-May 15....	1–2	2-4 in.	15 in.	2 pt.	—	40–60
Peas.....	April 1-May 1...	2	2-4 in.	3 ft.	1 pt.	5–15	50–65
Crops in Sec. II..							

IV. Crops That May Follow Others.

Beet late.....	July-August.....	2	3-4 in.	15 in.	1 oz.	7–15	75–90
Borecole.....	May-June[2].....	½–1	2-ft.	2½ ft.	25	5–10	85–120
Broccoli.....	May-June[2]	½–1	2 ft.	2½ ft.	25	5–10	100–140
Brussels Sprouts.	May-June[2]	½–1	1½ ft.	2½ ft.	35	5–10	100–140
Cabbage, late...	May-June[2]	½–1	2½ ft.	2½ ft.	25	5–10	120–180
Cauliflower	May-June[2]	½–1	2 ft.	2½ ft.	25	5–10	100–140
Celery, seed.....	April.....	½	1-2 in.	1 ft.	1 oz.	12–20	125–150
Celery, plant....	July 1-Aug. 1....	—	6 in.	3-4 ft.	100		
Peas, late.....	May 15-Aug. 1...	2-3 in.	2-4 in.	4 ft.	1 pt.	5–10	50–75
Crops in Sec. II.							

[1]In the vicinity of New York City. Each 100 miles north or south will make a difference of 5 to 7 days later or earlier.

[2]This is for sowing the seed. It will take three to six weeks before *plants* are ready. Hence the advantage of using the seed-bed. For instance, you can start your late cabbage about June 15th, to follow the first crop of peas, which should be cleared off by the 10th of July.

[3]Distances given are those at which the growing *plants* should stand, after "thinning." The seed, for crops sown in drills, should be sown several times as thick.

[4]Best started in seed-bed, and afterwards transplanted; but may be sown where wanted and afterward thinned to the best plants.

Table of Vegetables, Varieties, and Quantity of Seed required for a 50-foot row

VEGETABLE	VARIETIES	SEED
Asparagus	Barr's Mammoth; Palmetto	50
Bean, dwarf	Extra Early Red Valentine; Improved Refugee; Golden Wax (lima); Burpee's;	1 pt.
Bean, Pole	Golden Cluster Wax; Old Homestead (lima) Early Leviathan	½ pt.
Beet	Edmand's Early; Eclipse; Crimson Globe.	1 oz.
Broccoli	White French (resembles cauliflower but hardier)	40
Brussels Sprouts	Long Island Improved	40
Cabbage	(Early) Jersey Wakefield; Glory of Enkhuison; Early Summer; Succession; (Savoy) Perfection Drumhead; (Red) Mammoth Rock	25-40
Carrot	Early Scarlet Horn; Danvers Halflong Oxheart	½ oz.
Cauliflower	(Spring) Early Snowball; (Autumn) Algiers.	25
Celery	(Earliest) White Plume; Golden Self-blanching; (best for winter) Giant Paschal	100
Corn	Golden Bantam (early and sweet); Cory; Stowell's Evergreen	½ pt.
Cucumber	Extra Early White Spine; Fordhook Famous	½ oz.
Egg Plant	Black Beauty	25
Endive	Broad Leaved Batavian	½ oz.
Kale (or Bonesole)	Dwarf, curled Scotch	25
Kohlrabi	Early White Vienna	¼ oz.
Leek	American Flag	½ oz.
Lettuce	Big Boston; (Loose-head) Simpson; Mignonette (recommended); New York; (Cos) Paris White	50
Melon, Musk	(Green-flesh) Netted Gem; (salmon-flesh) Emerald Gem	½ oz.
Melon, Water	Cole's Early; Sweet Heart	¼ oz.
Okra	(For northern states) Perfected Perkins' Long-Pod; (southern states) White Velvet	25
Onion	White Portugal; Red Weathersfield; Yellow Danvers; Prizetaker	½ oz.
Onion Sets	(You can get at the hardware stores)	1 pt.
Parsley	Emerald	½ oz.
Parsnip	Imperial Guernsey	¼ oz.
Peas	(Dwarf early) Alaska; Gradus; Boston Unrivaled	1 pt.
Pepper	Ruby King	25
Potato	Early Rose; Early Harvest; Green Mountain; Vermont Gold Coin	½ pk.
Pumpkin	Dunkard; Quaker Pie	¼ oz.
Radish	Scarlet Button; Early White Turnip; Crimson Globe	½ oz..
Rhubarb	Myatt's Victoria	25
Salsify	Sandwich Island Mammoth	¾ oz.
Spinach	Victoria; (for summer) New Zealand; (for continuous cutting Swiss Chard (Beet) is especially recommended)	½ oz.
Squash	(For summer) Bush Fordhook; Delicata; (winter) Hubbard	½ oz.
Tomato	(Earliest) June Pink; Fordhook First; Matchless	20
Turnip	Petrowski; Golden Ball; (Rutabaga) Purple-top Yellow	½ oz.

THE GARDENER'S KALENDAR

XVII

THE GARDENER'S KALENDAR

THERE is nothing in the world that refreshes the memory like experiences that have left a strong impression on the mind, yet it is well, now and then, to anticipate the things one has to do, or may do, each month in the garden by having at hand a Kalendar of monthly garden operations, conveniently and briefly set forth.

The garden beginner will find the following monthly reminders compiled from various sources of service to him, and they have been selected, as nearly as possible, to apply to all those parts of the country where extremely early seasons are not to be looked for each succeeding year as they are to be in the South.

JANUARY

HAVING given thought to the planning of your next season's garden, and the things you may wish to plant in it, do not forget the important matter of anticipating its careful cultivation,—of the garden tools and implements which you will need in working it properly. There will be spades, hoes, lawn mowers, trowels, knives, sprayers, etc., to think of and to select from the best devices offered by progressive manufac-

turers. In gardening, like in everything else, good tools facilitate good workmanship and are great time-savers.

Perhaps a glance out of your window over a strip of ground that now appears bleak and dreary to you will suggest that another January should find a tree, or a clump of shrubbery, with bright stems to give some sense of color and winter design to the landscape. It is just that difference between the monotony of snow-covered prairies and snow-blanketed woodlands that brings Nature to teach man some of her decorative arts.

A clump of Spireas will bring you both color and decorative form in winter—*Spiræa ariefolia*, which retains its dead flower clusters a long time, a pleasant contrast of brown against the white snows, and *Spiræa Lindleyana*, whose bright colored stems also enliven the lines of the gray landscape.

Start the tuberous plants, Gloxinias and Begonias, now, if you would have them bloom early. Put them in flats, thickly together, and cover lightly with sandy earth. Avoid their rotting, and pot as soon as roots are developed.

Winter mice and rabbits may be girdling your trees. If so, bind strips of tar-paper around each tree thus attacked, high enough, however, to be above the probable snow-line.

An old-fashioned garden of this sort was the result of one garden beginner's first season's experimenting

What a garden beginner may do to beautify the walls of his home

Everyone may have such a little garden as this. Hardly a space is too tiny for some growing things

These are the principal flowers whose seed may now be sown in the greenhouse: Pansy, Lobelia, Verbena, Marguerite, Carnation, Snapdragon, Petunia, Daisy, Forget-me-not, Wishbone Plant, Impatiens, Salvia and Canna.

If there is carting and wheeling to be done around a place now is a good time to do it, when the ground is hard and the turf will not be cut up by wheels to leave unsightly streaks across the summer lawn.

Plan early to order your Chrysanthemum cuttings so you will have good material for fall exhibition.

It is too early of course to make hotbeds outdoors throughout northern states, but one may sow almost all kinds of vegetable seeds indoors for early crops if care is taken and proper light, heat and ventilation provided.

See that the spots in your garden where you have had Campanula growing are carefully protected.

Send to your seedsmen for catalogues if you have not done so already, and give careful thought to the contents of these, not only in the matter of selecting the things you like and admire, but with forethought of planting effects.

FEBRUARY

NOW is the time to take cuttings of your Stevia (*Piqueria trinervia*), or as soon as it is through its Christmas flowering. From time to time shift them until they are ready for 6-inch pots. Then plunge them outdoors in ashes when all danger of frost is past, turning the pots every day to keep them from rooting into the ground. Induce a bush form by pinching out the growths. Store the plants in a light cool place as cold weather comes on, and bring a few of them at a time into the flower room. Thus, in succession you will have the Stevia for November, December and January.

Don't forget that you may have some spraying to do in February.

Hotbeds will hardly be started as early as February in parts of the country north of Philadelphia, surely not near Chicago, Detroit or New York.

If you are intending to start a Mushroom crop you have no time to lose now.

Cuttings may now be taken for Paris Daisies, Chrysanthemums, and Begonias for October and later flowering. It would be well to buy small greenhouse plants at this time to be grown through the summer to maturity.

Achimenes tubers should now be started in flats, in light soil, with leaf mold and sand, and sheep manure to enrich it. A temperature of 60 degrees will be required at night.

If you are digging around your garden at any time remember that dug-in snow chills the soil where roots may be dormant, consequently they will be injured or killed by thoughtless treatment of this sort.

Don't forget that your lawn needs winter care. Top dress it with fine manure.

Both Gladioli and Cosmos may be started indoors now for early bloom and bedding plants propagated from stock plants.

Place your orders early with your nurseryman if you would avoid disappointment in the rush for good plants that always seems coincident with the beginning of every season's rush work.

If you procure your seeds in time you will have an opportunity of testing their germinating qualities before the regular outdoor planting season.

Among the indoor vegetable seeds you will be sowing in February for outdoor transfer in May are lettuce, tomatoes, cabbage, eggplant, celery, onion, endive, radishes, parsley, etc.

For early vegetables start beets, cauliflower, string beans, kohlrabi, etc., in greenhouse or window for later transference to hotbeds and coldframes.

Inspect your house-plants, especially palms and ferns, and if you find their roots greatly grown and spread, shift them to larger pots.

MARCH

TAKE a look around the lawn and see what repairs it will be needing, and get out your lawn tools for a thorough overhauling, so you may plan for others you may wish to order.

If you have mulched your lawn the autumn before, remove this mulch the first day the frost leaves the ground otherwise the roots under it will take an unnatural start, which will receive a severe setback by later frosts.

Examine your porch vines and tie them up with new fastenings where needed.

Look over your garden paths and walks and plan their betterment. Flagstone and flat stepping-stones can be employed usefully for these.

Nitrate of soda as well as common salt will help the growth of your rhubarb and asparagus if put on the beds in March.

You may prune your Hydrangeas, Dogwood and Elders now, and if you have forgotten to prune your grape-vines it is better to do it now than not at all. Hybrid perpetual Roses may be pruned back to one or two feet as soon as frost leaves the ground.

By March 15th it will be well to uncover your bulb beds and also your hardy borders.

Put boxes and barrels around your rhubarb plants after the snow has gone, and put manure over them. At night they should have a top covering.

Sow inside under cover Bachelor Buttons, Calendula, Drummond Phlox, French Marigolds, double Petunias, Lantana, Cannas, Coleas, Heliotrope (for budding out), Ostrich Plume Chrysanthemums and Chaubaud Carnations (for October and later flowering), Ardisia (for bloom next spring, and berry fruit the Christmas after), Dahlias (to flower this season), among other flowers.

Lily-of-the-Valley pips should be started right away, in time for Easter bloom. Your Snowdrops, Scillas, Crocus, Hepaticas, Magnolias and English daisies should be blooming this month. Bring forth the rest of your bulbs from the cellar.

Magnolias of all varieties, hybrid Rhododendrons and Mountain Laurel should be set out only in the spring, and then as soon as the ground may be worked.

Orchard trees may be transplanted as soon as the ground will work up to a fine and mellow soil. They should never be put into a sticky mortar-like soil. Deciduous trees and shrubs may now be set out.

Remember that all your spraying should be finished by the middle of April.

Sow lettuce, globe artichokes in cold-frames and hotbeds, beets, carrots, onions, tomatoes, egg-plant and peppers in flats; also thin out those already up which you started earlier.

If you sow parsley now indoors you will have a good April crop. Before planting parsley seed soak it in warm water for a day, as it is very slow to germinate.

If the season is a very early one get your Sweet Pea seeds into the ground early.

Fork asparagus beds lightly, first spreading well-rotted manure or bone meal on the ground.

APRIL

SET out Standard Box and Box-edging early. Where Box-edging has been set out the year before, it can be pruned somewhat before growth begins in April. All varieties of hedges may be set out this month.

This is the month for planting deciduous trees, shrubs and vines, fruit and nut trees (especially dwarf varieties) and small-fruit bushes.

Fertilize asparagus bed and rhubarb patch with nitrate of soda.

Prune grape-vines and fruit trees, but not small-fruit bushes.

Examine your shade trees and if you find any cavities of decay in their trunks clean these out and fill up with cement.

Look to the matter of this month's spraying, and do not neglect any part of your garden.

You will need to divide roots of your perennials in the hardy border this month.

You can plant all evergreens this month.

Remove winter mulching from your strawberry bed.

Tender roses may be pruned late in the month; also spray them with whale-oil soap.

Have your coldframes ready for transferring to them tender vegetables and flowers from the hotbed for hardening by the middle of the month.

If you sow seeds of perennial flowers now in cold-frames they will bloom their first year.

Plough or spade the garden as soon as the surplus moisture from departing frosts is out of the ground.

Spray seedling Hollyhocks with Bordeaux mixture.

Sow Sweet Peas as soon as the ground can be worked, and also Love-in-a-Mist (*Nigella Damascena*) for the garden border.

Start your Cannas in the hotbed.

Prepare labels for the seeds you will be planting.

Look over your garden tools and see that they are all in good condition, and sharpen those which need it.

This is a good time to build a birdhouse, for birds are friends to your garden oftener than enemies. But for them many of your plants would be killed by the insects the birds destroy.

MAY

BE prepared against late frosts but do not rush the season, though you should plan not to be behindhand with anything. When all danger from frost is past transplant your tender flowers and vegetables from hotbed to garden.

Now is the time to sow everything required for succession, late Peas, Beans, Cabbage for late use, Cucumber, Radish, late Broccoli, Winter Kale, Vegetable Marrow, Brussels Sprouts, Horn Carrot and Main Crop Carrots, Spinach, Turnip, Beet, Parsley, Colewort, Onion, Lettuce, Cauliflower, Parsnip, Ridge Cucumber. Also Phlox Drummondii, Marigold, Calceolaria, Ten-week Stock, Cineraria, Primula, Ornamental Grasses, Grass Seed and Aster.

Remember to spray your orchard trees as soon as the petals fall from the blossoms.

The middle of the month is the time to spray your rose bushes with whale-oil soap, and the last week in May they should receive liquid manurial stimulant.

Mulch your strawberries just before they bloom.

Sow all hardy annuals and transplant such as you have had started in coldframes in March, which have been hardened off. It is not too late to sow tender annuals in coldframes for later transplanting.

Shift perennials, and rearrange border plants. This can be done with safety by the end of the month.

This is a good time to think about flower-boxes for porch and windows.

Gladioli planted this month will bloom in August.

Look out for cut-worms that will be appearing in your garden soon. Dig them up and kill them as soon as you find any of your young plants dying without any apparent reason. Cut-worms are probably chewing at the roots.

Carnations may be taken from the greenhouse for outdoor planting the latter part of the month.

Plant Sunflowers, if only for the sake of such useful birds as the Goldfinch and Nuthatch.

Now is the time to plant hardy border plants, Alpines, Climbers, and especially Gladioli, Gaillardias, Pyrethrums (cut back for late flowering), Delphiniums (cut back for late flowering), Geraniums, Chrysanthemums, Hollyhocks, Clematises, Ivies, Passion Flowers, Dahlias, Calceolarias, Phloxes, Pentstemons, Cannas. Also Potatoes, Broccoli, Brussels Sprouts, Celery and Lettuce.

After the grass is well started fertilize your lawn with pulverized sheep manure.

Remember that just after they finish blooming is the time to prune all spring-flowering shrubs.

Spray your Elms now and thus begin the fight against the Elm-leaf beetle.

JUNE

WATCH the newly set trees and vines to see that they start right. Rub off all shoots on bodies and at base, also surplus shoots on branches. Allow only one or, at most, two shoots to grow on grape vines. Keep soil stirred or mulched about trees and vines. Treat as weeds all shoots from the blackberries and raspberries and other suckering things except such as are needed for new plants. Keep blossoms and runners from newly set strawberries. Pinch tips of "cap" raspberries when two feet high. Watch out for currant worms on currants and gooseberries, rose beetles on roses, grapes, plum and cherry trees.

June is the month of belated things and of the beginning of the forward look. Plant more flower-seeds for later display; start Coleus cuttings to fill in unexpected gaps; sow Perilla, Dwarf Nasturtiums and "Rose Moss" (Portulaca) seeds in semishady places to take the places of failing early annuals; sow winter stock seed to take up in autumn for the window garden; start seeds of biennials and perennials for the following year's blossoming bedders—Heucheras, Campanulas, Anchusas, etc.

For late crop sow beets, carrots, potatoes, and for succession radishes, sweet corn, beans, and turnips. Transplant cabbages, cauliflowers, tomatoes, celery, peppers.

Look out for cut-worms in your garden beds.

Spray for garden pests. Spray berry bushes and fruit trees twice in June.

June is the critical gardening time—you must weed and cultivate carefully and persistently for successful results.

Privet hedges may be trimmed this month.

Plant Dahlias and Gladioli.

Begin to tie up Tomato vines.

Set out Cabbage and Cauliflower plants in rich soil. Well drained clay soil is best for Cabbage.

Tender annuals planted after June 1st will develop with wonderful rapidity.

JULY

CUT back hybrid perpetual Roses about six inches after June bloom is over and with fertilizing and cultivating a second crop of blossoms may result in the same season.

Plant Artichokes the middle of the month.

Keep your flowering plants such as Chrysanthemums, Cosmos and Dahlias to a compact bushy growth by "pinching."

As fast as you find suckers forming on fruit trees remove them at once.

Keep Sweet Peas, Marigolds, and other flowering annuals picked, for their plants will soon cease to bloom if allowed to go to seed.

You may have dwarf Asters for late bloom in window boxes for the autumn if seed of these is sown now.

Harvest early vegetables and rework and replant soil for late crops.

AUGUST

THIS is a good time to plant Evergreens and thus avoid the rush of spring work. Do not wait until September to do this, as the plants, set out now, will get a firmer hold on the soil before winter sets in.

Sow perennials in coldframes, which will prevent the seeds from being washed out of the earth by late rains.

Carnations that have been growing outside in the garden must now be brought indoors.

Easter Lilies may be potted this month for forcing. They should be kept in a cool, dark place until they are thoroughly rooted.

Cut out the old canes from your berry bushes.

SEPTEMBER

THIS is the time to establish new beds, which may be filled with the thinnings from the hardy perennials. Do not, however, move hardy Chrysanthemums, *Anemone Japonica*, Yuccas, late Tritomas, Magnolias or Altheas; these are best moved in April. The young plants of Hollyhocks, Foxglove, hardy Gaillardia, Sweet William, and Clove Pinks if not transplanted by September 20th should be left undisturbed until spring.

Perennials which are now being grown in boxes from the seed should, by the 15th of the month, be planted in the garden where they are to bloom. Protect them in the winter with a light covering of straw or manure; that will keep them from being affected by sudden changes of the weather.

In the border or among shrubs there can be no more attractive flower than the Larkspur (*Delphinium*). There is both the annual and perennial, and the shades of flower bloom are almost numberless, including light, dark, and azure-blue, white, buff, rose, apple-bloom, pink, brick-red, red-lilac, dark-lilac, violet, and fawn. The seed of either the annual or perennial should be sown now in the open. Germination will take place early in the spring and remarkably early growth and bloom will be secured. It is almost difficult to go wrong in the selection of a variety—that should be left

to the individual preference of colors and whether single, semi-double or double blooms are desired. A bed of Larkspur is strikingly effective in almost any garden. It makes a good cut flower, and the plants will bloom almost continually if the blooms are removed as they fade.

No ironclad rule for every section of the country at once can be made as to when and how to prune shrubs. In a general way such as bloom before midsummer produce flowers on wood grown the previous year, and these should be pruned immediately after flowering, as to prune them in the spring would be to cut away the wood which would produce blooms. Such as bloom after midsummer can be pruned in the spring as they produce flowers on wood made the same season. All pruning that is essential to shrubs is such as is necessary to keep the plants in symmetrical shape and to admit unobstructed circulation of air and sunshine.

When massed in beds or borders Peonies are at their best. This is, however, open to some objection as they are in bloom for only a month. If used in connection with other plants, such as Asters, Gladioli, late-blooming Cosmos, or Lilies, perhaps more satisfaction would be had. Despite the short season of bloom the foliage of the peony remains vigorous and green during the summer and fall months.

After the blooming season is over work into the soil about the roots of each plant a handful or so of pulver-

ized sheep manure. After the ground is well frosted apply a mulch of stable manure of five or six inches thickness and let it remain until spring. That will prevent the alternate freezing and thawing of the ground near the roots. It is the freezing and thawing, and not the freezing itself, that damages or destroys the plants. In the spring when the mulch is removed work into the ground another application of pulverized sheep manure. Pulverized sheep manure is best, as no other fertilizer appears to contain all the requisite essentials to produce such luxurious and bounteous growth.

About the next most important phase of the garden work will be the fall planting of bulbs, both for indoor and outdoor culture. If bulb culture is to be carried on even to only a limited extent, there are some necessary primary preparations to be looked after. It is just as well to arrange these preliminaries now.

Failures are usually due to lack of proper treatment both in planting and culture. Get together a liberal supply of proper soil and a supply of pots. Have the soil very rich, loamy and free from small stones. A liberal quantity of powdered charcoal will be a desirable addition, as it acts both as an aid to drainage and purifies the soil, preventing souring. If the new catalogues have been received it is a good time to begin considering a selection, and in making the selection keep in mind the fact that small bulbs should be grouped; half a dozen or more planted together give more satisfactory results than when the same number are planted singly. It is

only bulbs that produce large flowers and foliage that make a fairly presentable appearance when grown singly. Soft-baked, porous, wide-mouthed, shallow pots are usually preferable for bulb culture.

This will doubtless prove one of the most trying months of the year on the lawn. To keep it at all decent looking frequent use of the hose will in all probability be necessary. In using the hose do not simply sprinkle, but wet the sod. It is a mooted question as to whether mere sprinkling does not do more harm than good, especially if the sprinkling is followed by a hot sun.

Save all possible material about the garden for mulch. Lawn clippings, chopped straw or leaves, and old flower stems cut small, will be found useful. Any of this material placed about plants, leaving space around the roots to admit air, will prove of great assistance in the retention of moisture. A hot or dry weather mulch is intended to keep the sun's rays from the upper sod but not to shut out the air.

In northern sections Jack Frost is to be looked for this month.

If any particular choice plant about the yard shows signs of distress from the heat or drought, remove a few inches of the top soil around it, leaving a narrow rim about the plant however, and then make a few holes with a sharp stick, leading towards the roots.

Pour water into the cavity made by the removal of the top soil until the ground has soaked up so much water that no more will soak away. Crumble the removed soil as finely as possible and place it back into its former place, but do not pack it. This simple process will often save some valuable and rare plant.

OCTOBER

THE bare spots in the lawn should be looked after. Loosen the bare places with a sharp rake and then treat them to a dressing of pulverized sheep manure, and seed liberally. After seeding, again rake over the surface so that the seed will be well covered. This should be followed by the use of the roller to smooth the surface. The finer the soil can be made before seeding, the better will be the result in securing a good stand of grass. If the lawn is well cared for, properly fertilized, and kept closely mown, the sod will improve from year to year. Many gardeners think that the grass should be let grow rather tall about this time of the year to make a protection for the roots. This is a mistake; the lawn should be kept closely mown until the grass ceases to grow. If left to get tall a great deal of the grass will die out during the winter and this long grass will have to be raked out by hand in the spring before the lawn can be made to take on a fresh appearance. If closely mown late in the fall it will start into growth very early the following spring. Bone dust and pulverized sheep manure, preferably the

latter, make good lawn fertilizers. It is not necessary to have the lawn unsightly all the winter months through the use of coarse stable straw-manure. Give a good top dressing of pulverized sheep manure —that is sufficient.

October is the best time of the year in which to plant ornamental trees and shrubs, except in localities where the winters are extremely severe. In the selection of both ornamental trees and shrubs regard must be had for the adaptability of the subject to the climatic conditions existing where it is to be planted. In planting always make the hole at least a foot wider than the root area of the specimen, and the depth according to the depth of its root system. If the earth at the bottom is a stiff hard clay, or a gravelly hard-pan, it should be broken up to a depth of a foot or more and a goodly portion of sods and manure incorporated with it. If the soil where the tree or shrub is being set is poor, a good compost of well rotted manure, leaf mold, and sods should be thrown in and dug in to a depth of six inches or more.

Sweet Pea seed planted now to lie dormant in the ground all winter will give much earlier bloom than the earliest spring planting. Fall planting is especially desirable for well drained, light, sandy soils, as the vines start early in the spring and come into flower much earlier than they would in a heavier soil, where they make a much stronger growth. The period of Sweet

Pea blooming may be very much extended by placing a mulch of fine straw or grass about the roots, keeping them well watered and the blooms picked off. It is well to keep in mind that sweet peas will not do well planted in the same soil two years in succession. But if they are desired in the same location the trench method can be resorted to—the old soil taken out and the trench refilled with new soil and manure. Sunlight and fresh air in abundance are essential to successful sweet pea development. In the shade the vines will make a tall growth, little foliage, and less flowers; in damp places the foliage is apt to mildew and the vines die off without flowering. Shade and prepare the ground properly, having it in a fine loose condition, putting on a liberal application of well rotted barn manure, or pulverized sheep manure, before spading. Use a liberal quantity of seed to make sure of a good stand—one ounce to fifteen feet of row is sufficient—and, when well started, thin out the young vines until they stand from four to six inches apart. Light two-inch-mesh poultry wire makes a very convenient support for the vines. A better and more satisfactory way of supporting the vines is to drive stout round stakes, four or five feet high, every four or five feet along the row, and then run light jute twine from stake to stake, commencing a few inches from the ground and putting the twine about six inches apart on the stakes. The best support for the sweet pea vine, however, is brush cut from the ends of tree limbs or from young bushes.

These when firmly planted in the soil allow the vines to grow in a more open way than the trellis made of either wire or twine. The support for the vines should be provided before or as soon after planting as possible so that the first tendrils may attach themselves firmly to the supports. Commence cultivation as soon as the plants are above the surface and continue it during the entire season. About the only thing to be done is to keep the soil loose and fine for a depth of two or three inches. Frequent workings keep out weeds and admit the air more freely to the roots, and keep the soil in the best condition for plant growth. During dry weather thoroughly soak the roots of the vines twice a week. Do not allow seed pods to form on the vines, and keep all faded or dried flowers picked off. Cutting the branches or tips of the vines back occasionally will induce them to branch and thus prolong the season of bloom.

Childhood recollections of spring flowers are usually associated with the fragrant Hyacinth. The florists have not been able to supplant or even approximate it for early out door flowering. Delightful effect can be had by massing different varieties that grow approximately the same height and bloom at the same time. Now is the time to plant Hyacinths in the open. They do best in light soil with sunny exposure, and where the soil is naturally heavy it should be lightened by the addition of sand. Spade the bed to a depth of twelve or fourteen inches, letting it rise only very slightly above

the level of the walk. Plant the bulbs evenly at a depth of about six inches. To plant them at uneven depths is sure to produce irregular blooming. The bulbs should be set from six to eight inches apart and care should be taken not to firm the soil too much around and over them. To set each bulb in a handful of clean sand is a guarantee of proper drainage. After the ground freezes cover the bed with a few inches of dry litter, evergreen boughs, or straw manure which should remain through the winter.

The Hyacinth is equally desirable for pot culture. For this purpose the large varieties should be chosen. They should be set singly in 5-inch, or smaller pots; a 7-inch pot will carry three bulbs very effectively. The best potting soil can be had by using two parts of fibrous loam to one part of pulverized sheep manure, with the addition of a little powdered charcoal. First fill the pot and then press the bulb into the soil, leaving about one-third of the bulb exposed. Bury the pot in the ground with its top about six inches under the surface and leave it in the open five or six weeks, by which time it will be well filled with roots. It can then be taken into the house where it will soon be brought into flower by the warmth. Continue to pot until the end of November for a succession of bloom. Supply plenty of water, and when the flower-spikes appear hasten development by the application of liquid manure.

Both for beauty of form and brilliancy of coloring there is no flower that equals the Tulip. It is admirably

adapted for the border around the house. By the harmonious massing of contrasting colors the most gorgeous effects can be produced. Tulips are also invaluable for pot culture. The color of bloom and height of growth are usually given by the nurseryman and that makes it an easy matter to select just what is wanted. The cultural directions given for the Hyacinth are equally applicable to the Tulip. However, as the bulbs are smaller they should not be planted quite so deep. Four inches to the bottom of the bulb set in the open is enough, while the distance between the bulbs can be four to six inches. A 5-inch pot will contain satisfactorily from three to five bulbs. The double Tulips generally come into bloom later than the single variety, though there are some late flowering single ones.

Add the Narcissus to your selection of fall planting for spring flowering. They are very easy of cultivation and do well in almost any soil and situation, but preferably in stiff soil and shaded location. The Narcissus is grown extensively in pots for winter cut flowers and requires practically the same treatment as has been suggested for Hyacinths and Tulips. The Jonquil is related to the Narcissus and is suitable alike for pot culture or planting in the open.

If a Rose bed is planted now, good bloom may reasonably be expected next spring. The plants may be set out any time before the ground freezes hard with prefect safety, but should be mulched when real winter

weather sets in. The White American Beauty is one of the best white Roses grown, and is hardy everywhere. The General Jacqueminot is a very desirable red rose. There is no finer pink rose than the Paul Neyron. For a dark crimson, the darkest of all, Prince Camille DeRohan sets the pace. Hardy climbing roses, of which there are many varieties, should be planted during the autumn.

Manure the garden and plough it under this month.

Rake up fallen leaves, and save them as a mulch for covering flowers and shrubs. Hard-wood leaves like oak and chestnut are especially good.

NOVEMBER

THERE is considerable work now necessary about the vegetable garden and in the orchard. If a shade tree is needed to be set, now is the time to transplant it. If a fruit tree is desired, put it out now; or if one already out is found to be diseased, remove it and replant at this time. Between the falling of the leaves and the freezing of the ground is the best time for planting trees.

It is a good plan to rake the top earth for about an inch in depth, from around fruit trees and make an application of air-slaked lime. Let this remain exposed for about two weeks, then replace the top soil and mulch for winter protection.

Have a general cleaning up about the yard and save all leaves instead of burning them. Incorporate these with lime and rakings into a compost heap. The compost will be found both convenient and useful for broadcasting before spading the vegetable garden in the spring.

Plants of lettuce, cauliflower, cabbage, etc., that are to winter over for early spring settings should be put into the coldframe.

By giving the lettuce bed protection in the way of a covering with an old sheet or straw held above the plants, nice heads of lettuce may be had in the open until Christmas.

Beets, carrots, turnips, celery, and late potatoes should be stored in a cool dry cellar for winter use.

As the beds are cleared of existing crops they should be thoroughly composted and dug over. Then sow, broadcast or in drills, corn salad, kale and spinach, and enjoy them for early spring use.

The strawberry bed should have attention now. The plants should be thinned out and the beds heavily mulched.

Transplant the red raspberry, and mulch heavily when the ground freezes hard.

Lilies and other flowers grown from hardy bulbs, which are to be left in the ground all winter, should

always be planted on beds slightly raised above the surrounding ground to insure proper drainage throughout the year. When the tops die down cut the stems off and cover the beds two or three inches deep with leaves, or long, strawy manure to guard against sudden changes of freezing and thawing.

There are a great many flowers that do better from seed planted in the fall of the year. The Carnation is hardy and the plants from seed sown in the fall will bloom next season. Others, among those of which the seed can now be sown to advantage, are the Hollyhock, Chrysanthemum (perennial), Phlox, Poppy (Oriental), Aster (hardy Alpine), Campanula (Canterbury Bells), Aquilegia (Columbine), Digitalis (Foxglove), and Primula (*vulgaris*). Pansy seeds are planted largely in the open ground in the fall for spring bloom. An examination of the autumn catalogues issued by the nurserymen and seedsmen will enable one to extend this list for fall planting. Send for catalogues and enjoy one of the greatest pleasures of gardening—the pleasure of anticipation.

When the cool nights blight the foliage of the tuberous-rooted Begonias, the plants should be dug up, the tops removed and the roots allowed to dry gradually in a cool, sheltered place. When thoroughly dry and ripened, clean off the small rootlets, wrap each bulb in soft cotton, and store them in a moderately warm place until spring.

A great many hardy perennials do best when planted at this season of the year. They get well established during the winter and are ready to start growing with the spring. Prepare the ground well before setting them out; spade to a depth of eighteen or twenty inches, and generously enrich the soil. The perennial flowering pea (*Lathyrus*), Blanket Flower (*Gaillardia grandiflora*), Peonies, Japanese, German and English Iris, and Hollyhocks, are among the large variety of old-fashioned garden flowers which can now be planted to great advantage.

When the tops of flowers grown from bulbs, such as Gladioli, Dahlias, etc., die down, the tops should be cut off an inch or so above the surface of the ground, the bulbs dug and dried in a cool place. When well ripened, store in a warm room or cellar for the winter. If the place where storage is to be made is not perfectly dry and frost-proof, pack the roots in boxes or barrels, covering with dry sand or any other suitable material which will prevent shriveling or freezing.

DECEMBER

EVERY tree, shrub and vine about the garden will be vastly benefited by a liberal mulching at this time. With what to mulch should not be a troublesome question. Foliage of all kinds has been falling, is now almost through falling, and should be raked together and applied about the trees and shrubs to prevent

damage from alternate freezing and thawing of the ground. The new leaves can be held in place about the roots of plants by throwing over them a few spadefuls of coarse manure or rich earth. Besides the practical utility of the fallen and decaying foliage as a mulch, the garden will be left in a much more presentable condition when it has been gathered up.

It is better to prune grape-vines now than to wait till spring, as the vines pruned in March will be more liable to be damaged.

Bank up the plants outside in order that alternate freezing and thawing will not winter-kill them.

If tent caterpillars have bothered your garden the past season, cut down any wild cherry trees around you, for these are sure to attract these insect pests.

Coldframes for such flowers as Violets, and for the plants must be covered at night. Use straw mats and wooden shutters for this.

Saw off dead limbs from your trees.

Cut off tops of all perennials, and give a light mulch to all those requiring protection, but be careful not to use heavy manure.

This is the time of the year when all vines should be given assistance in the way of protection from the snows and ice formations. They should be gone over and carefully tied to some support so that they will not be broken or otherwise injured by the weight of snow and ice. If it is necessary to put up a post or stake for support do not hesitate to do so. There are more sightly things than stakes driven up through the yard, but the unsightliness is more than compensated for by the good results.

XVIII

TABLE OF SPRAYING FOR GARDEN PESTS

Table of First and Second Spraying With Key to Insecticides and Fungicides to Use

Plant	No. Recipe	First Spraying	Second Spraying
Apple	10	Before budding	Just before blossoms open.
Apricot	9	Before April 1	When fruit has set.
Blackberry	2, 9, 10	Before budding	When new canes ft. high.
Cabbage	2	When worms appear	Whenever necessary.
Cauliflower	2	When worms appear	Whenever necessary.
Cucumber	10	When plants come through earth	Whenever necessary.
Currant	2, 10	When worms first appear	When fruit half grown.
Cherry	3, 9	Before blossoms open	Just after blossoms fall.
Dewberry	2, 7, 10	Before budding	When new canes 1 ft. growth.
Gooseberry	2, 10	When worms first appear	When fruit half grown.
Grape	2, 9	Just before growth starts	When leaves third grown.
Melon	10	One month after planting	Every ten days.
Pear	9	Before budding	Just before blossoms open.
Peach	9	Before April 1st	When fruit has set.
Peas	7	With first appearance of aphides	Whenever necessary.
Plum	9	Ten days before growth starts	Just before blossoms open.
Potato	2, 10	When plants 6 in high	Every ten days till grown.
Quince	9	Before budding	Just before blossoms open.
Raspberry	2, 9, 10	Before budding	When new canes ft. high.
Rose	7, 11	April 15	Every ten days.
Strawberry	2, 10	When growth begins	Whenever necessary.
Squash	10	One month after planting	Every ten days.
Tomato	10	When rot or blight appears	Whenever necessary.

Table of Third and Fourth Spraying With Key to Insecticides and Fungicides to Use

Plant	No. Recipe	Third Spraying	Fourth Spraying
Apple	10	Just after blossoms fall	Ten days late.
Apricot	9	Ten days after fruit has set	If rot appears.
Blackberry	2, 9, 10	Ten days later	After fruit and trimming.
Cabbage	2	After heads form	Whenever necessary.
Cauliflower	2	Whenever necessary	Whenever necessary.
Cucumber	10	Whenever necessary	Whenever necessary.
Currant	2, 10	After fruit is picked	Fifteen days later.
Cherry	3, 9	Ten days after blossoms fall	Just after fruit is picked.
Dewberry	2, 7, 10	Ten days later	After fruit and trimming.
Gooseberry	2, 10	After fruit is picked	Fifteen days later.
Grape	2, 9	Just before blossoms open	Just after fruit sets.
Melon	10	Every ten days	Whenever necessary.
Pear	9	Just after blossoms fall	Fifteen days later.
Peach	9	Ten days after fruit has set	If rot appears.
Peas	7	Whenever necessary	Whenever necessary.
Plum	9	Just after blossoms fall	15 days after blossoms fall.
Potato	2, 10	Every ten days till growth stops	Whenever necessary.
Quince	9	Just after blossoms fall	Ten days later.
Raspberry	2, 9, 10	Ten days later	After fruiting and trimming canes.
Rose	7, 11	Every ten days	Every ten days.
Strawberry	2, 10	After fruit is picked	When leaf roller appears.
Squash	10	Every ten days	Whenever necessary.
Tomato	10	Whenever necessary	Whenever necessary.

INDEX.

Achimenes, 83.
Agriculture, Department of, 30, 36.
Agricultural Experiment Station, State, 35.
air, factor in soil, 8.
altitude, effect of, on plants, 5.
annuals, half-hardy, 4; hardy, 3; planting, 89; tender, 4.
aphids, 49, 59.
apple, 40.
April garden operations, 86.
asparagus, 84.
Aster, 89, 93.
athracnose, 54, 60.
August garden operations, 95.

bedding, 94.
biennials, hardy, 3; tender, 4.
birds, 88, 90.
blight, 53.
bulbs, 96, 102, 103, 105, 107.

cabbage-worm, 56.
calendar of garden operations, 79.
Campanula, 65, 81.
Carnation, 81, 90, 93, 106.
cherry, 40.
Chrysanthemum, 81.
clay loam,, 10.
Clematis, 42.
climatic conditions, 6.
climbers, 5.
coldframe, 45, 50, 51, 87, 89, 105.
Columbine, 65.
common names of plants, 14.
Cosmos, 83.
cotyledons, 19.
cultivation, 25.
currant, 41.
cuttings, 82.
cutworm, 56, 59, 92.
Cypress vine, 12.

Dahlia, 91.
Daisy, 81.
December garden operations, 107.
Delphinium, 94.
Department of Agriculture, 30, 36.
dibble, 21, 22.
diseases, plant, 54.
divisions of plants, 13.

Easter Lilies, 93.
evergreens, 42; hedges, 42.

fall sowing, 106, 107.
February garden operations, 82.
fertilizing, 29.
fertilizers, 29; complete, 32; essentials of, 32; sources of, 32.
flats, 16.
float, 17.
flower gardening, 64.

flower-beds, 2.
flower planting-table, 68, 69.
Forget-me-not, 81.
Forsythia, 41.
frost, 88, 97.
fruits, orchard, 86; small, 40; tree, 40.
fungicides, 53, 57.
fungi spores, 54.

garden, flower, 63, vegetable, 71.
garden operations: January, 79; February, 82; March, 84; April, 86; May, 88; June, 91; July 92; August, 95; September, 94; October, 98; November, 104; December, 107.
garden-making, first steps in, 1.
garden-paths, 84.
garden-pests, 53.
garden-tools, 61, 62.
germination of seed, 94.
girdling, 80.
Gladioli, 83, 90.
grapes, 83.

half-hardy annuals, 4; perennials, 3.
hardy annuals, 3; perennials, 3.
hedges, evergreen 42; 86.
Hibiscus, 41.
Hollyhocks, 53, 88.
Honeysuckle, 41.
hotbed, 45; ventilation, 49; sash, 46; spraying, 49; temperature, 48.
house-plants, 84.
Hyacinth, 101.
Hydrangea, 41.

indoor sowing, 16; flower-seeds, 85; vegetable seeds, 83.
Ipomœa, 12.
insecticides, 53, 58.
insect pests, 55, 108.
insects, chewing, 55; sucking, 55.

January garden operations, 79.
June garden operations, 91.

Kalendar of garden operations, 79.

landscape features, 2.
Larkspur, 95.
Latin names of plants, 11.
latitude, effect of, on plants, 5.
lawn, 83, 97, 98.
Lilac, 41.
Lily-of-the-Valley, 85.
lime dressing, 9.
liquid spraying, 53.
loam, 8; clay, 10; sandy, 10.
Lobelia, 81.
Lonicera, 41.

Manure, for border beds, 95; garden, 104; hotbed, 47, 48; lawn, 104; sandy soil, 9.
March garden operations, 84.
Marguerite, 81.
maturing plants, requirements of, 25.
May garden operations, 88.
Moonflower, 12.
Morning Glory, 12.
mulching, 84, 87, 89, 96, 97, 104.

names of plants, 11; common, 14; Latin, 11.
Narcissus, 103.
Nasturtium, 91.
nomenclature, 11.
November garden operations, 104.

October garden operations, 98.
orchard fruits, 86.

orchard trees, transplanting, 86, 104.
outdoor sowing, 89.

paths, garden, 84.
Pansy, 81.
peach, 40.
pear, 40.
Peony, 95.
perennials, from seed 3; half-hardy, 3; hardy, 3; tender, 4.
pests, insect, 59; fungous, 60; garden, 53.
Petunia, 81.
Phlox, 12, 13.
plant-diseases, 54.
plant-food, 30; in water, 31.
planting, annuals, 89; for succession, 89; hardy borders, 90; scheme, 2.
planting table, of flowers, 68, 69; of vegetables, 74, 75, 76.
plants, 25; sorts of, 3.
plum, 40.
Poppies, transplanting, 4.
Portulaca, 91.
pruning, 37, 85, 87, 90, 95; reason for, 37; trees, 42.

raspberry, 41.
recipes, fungicide, 59; insecticide, 58.
Roses, 41, 89, 103, 104.
rhubarb, 84, 85.

sandy loam, 10.
seed, annuals, 3, 5; biennials, 3, 5; perennials, 3, 5; catalogues, 11; soaked to promote germination, 12, 94; self-sowing, 6.
seed-sowing, directions, 15, 16, 19, 24; depth to plant, 16; in flats, 16.
seedlings, 21; fresh, 22; transplanting, 21.
self-sowing plants, 4; seeds, 6.
September garden operations, 94.
shrubs, 4; flowering, 41.
Snapdragon, 81.
soil, autumn working of, 10; classification of, 7; composition of, 30; deep, 8; fertilizing, 29; light, 8; modified, 8; moisture in, 26; requirements, 29; for seedlings, 21; sweetening, 32; test, 9; weathering, 9.
sowing, 15, 16, 19, 24; indoors, 3, 16; outdoors, 3, 4, 16, 17; perennials, 93; for late vegetables, 91.
Spirea, 41.
spraying, 53, 89; apparatus, 56, 58.
State Agricultural Experiment Stations, 35.
Stevia, 82.
Sunflower, 90.
Sweet Peas, 88, 93, 99.
Syringa, 41.

table, flower-planting, 68, 69; vegetable-planting, 74, 75, 76.
tender annuals, 4; biennials, 4; perennials, 3, 4, 94.
tillage, 26.
tools, garden, 25, 27, 61.
trailers, 5.
training, 37.
transplanting, 6, 19, 88; orchard trees, 86; perennials, 94; seedlings, 21.
tree-planting, 87, 99.
trees, 4.
trimming, 38, 39.
Tulip, 102.

vegetable-gardening, 71; seeds, 83; planting-tables, 74, 75, 76.
Verbena, 81.

Viburnum, 42.
vines, 5; tying up, 84.

watering, amount of, 18; excess, 17; seedings, 22.
weeds, 25, 61.
Weigela, 42.
window-boxes, 89.
winter plant-effects, 80; protection, 5, 94.

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